DECEMBER 19, 1955

NEWS ISSUE

Electrical World

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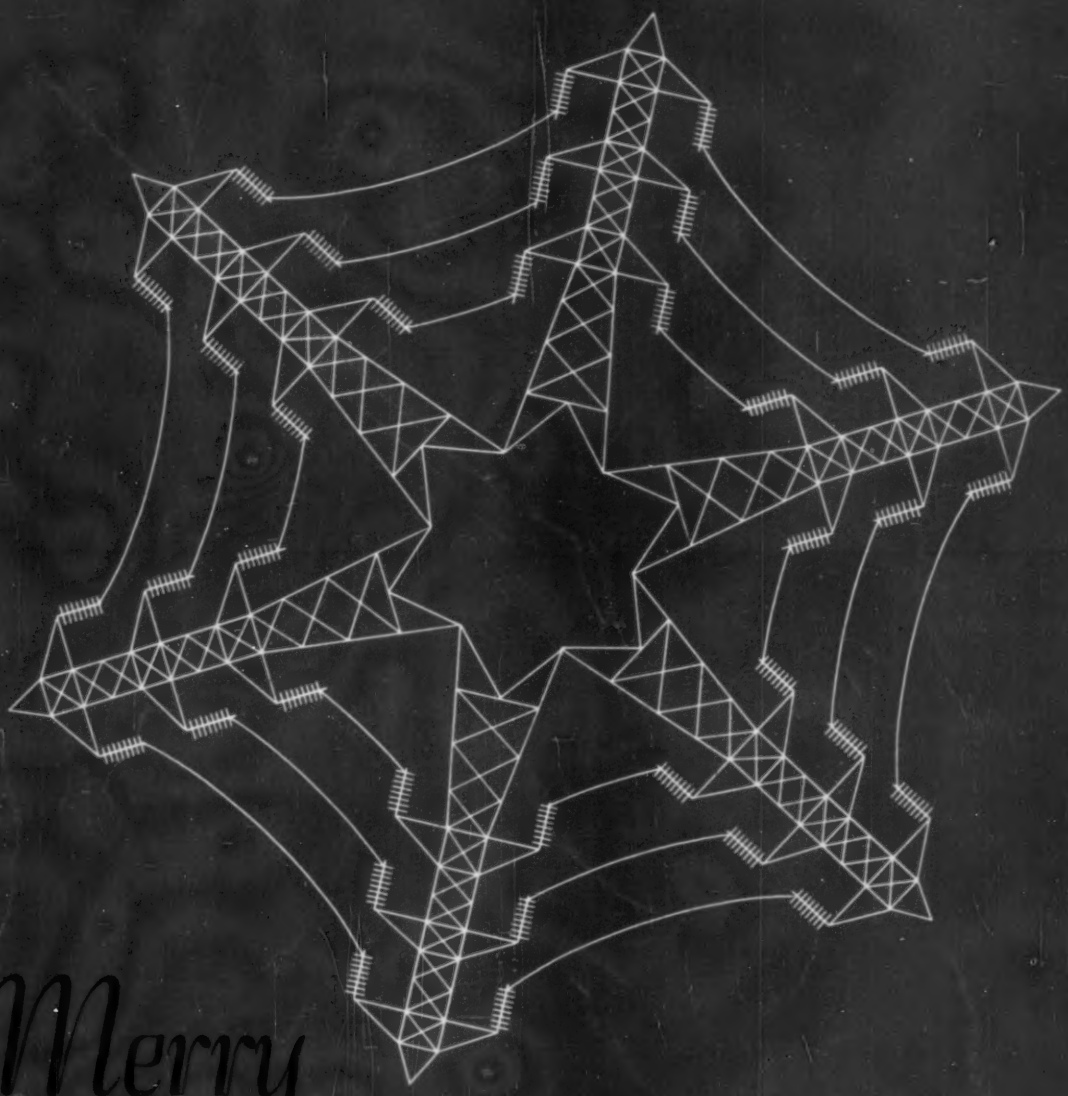

Merry Christmas

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UNIVERSITY MICROFILMS IN
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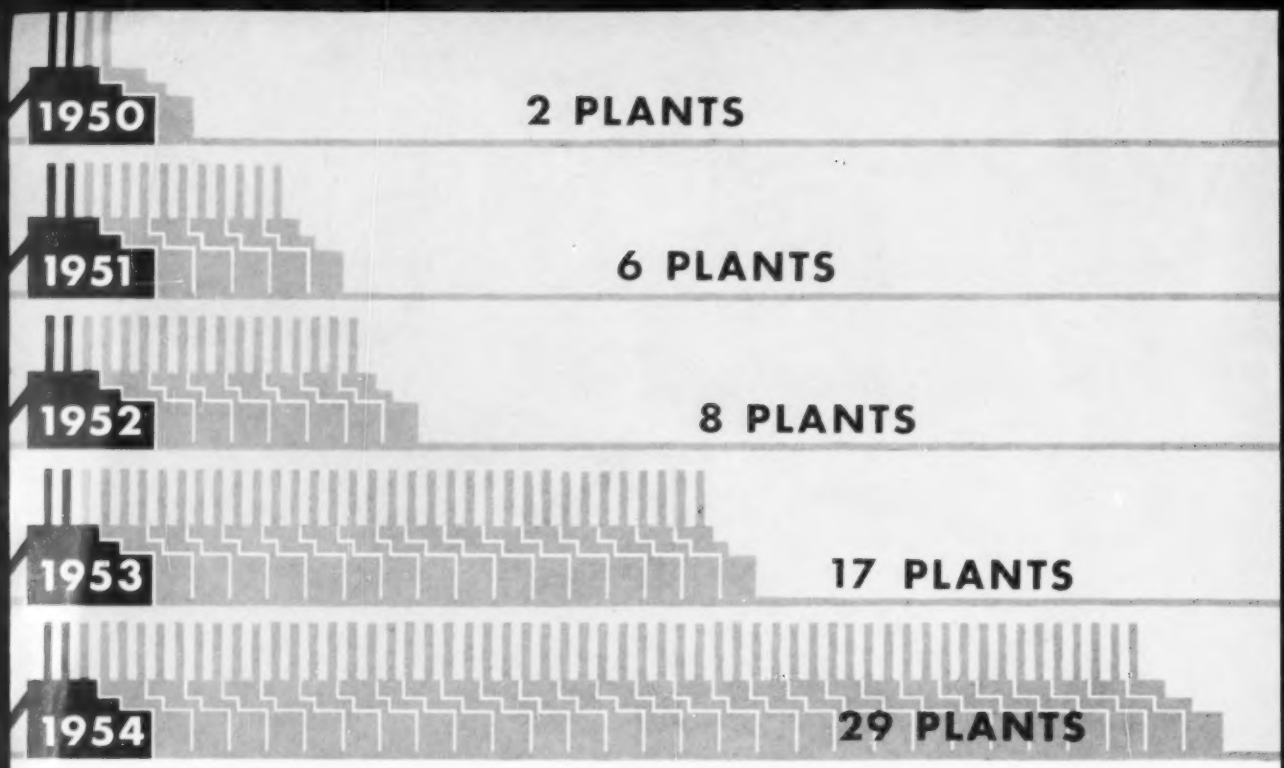
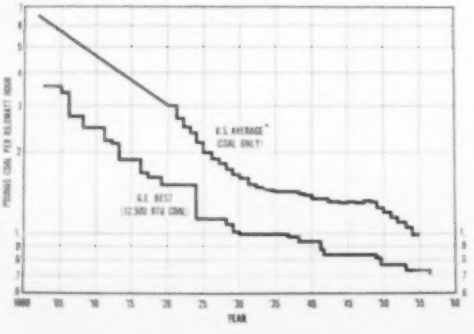


Soaring number of steam plants below 10,000 BTU/kwhr to

Spotlight trend to lower operating costs

▲ **HIGHER VOLTAGES** permit more economical transmission of large blocks of power. Here, 330-kv G-E switchgear helps protect highest voltage system in U.S. This switchgear and the accompanying 330-kv transformers are typical of G.E.'s engineering activity in promoting system efficiency, from generation through distribution.



STATION COAL RATE chart demonstrates rapid progress in electrical equipment efficiency. *U.S. Average figures shown are from F.P.C. reports, contrasted with G.E.'s most efficient machine. ▶

Report on 83% of utility steam-station capacity points up progress towards reaching top station efficiency

Here's dramatic proof of progress by the electrical industry in boosting system efficiency. According to the report of the Federal Power Commission, a total of 29 steam plants by-passed the mythical yardstick for "top efficiency"—less than 10,000 BTU's per kilowatt hour—during 1954.

This tribute to utilities, consulting engineers and equipment manufacturers takes on even greater importance in the light of forecasts of a trillion kwhr capability by 1965. It demonstrates the tireless efforts being made to improve the operating efficiencies of electric utility systems, reduce over-all system costs.

24 OF 29 GE-EQUIPPED

That 24 of the 29 "most efficient" steam plants in the U.S. are equipped with General Electric turbine-generators provides another example of the cooperation between utilities and G-E engineers to increase system reliability and reduce their operating expenditures. With General Electric's $165,000,000 program of expansion of research and production facilities now in full swing, it is hoped that the trend to greater system efficiency will continue at its remarkable pace. General Electric Company, Schenectady 5, New York. 301-308

MORE POWER TO AMERICA

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ELECTRICAL WORLD

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Electrical World

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Vol 144 No 25 December 19, 1955

MANAGEMENT

EXECUTIVE HEALTH: HOW TO PROTECT IT.....S. Charles Franco 16
Industrial Relations 51
Business Outlook 60
Finance and Regulation..... 63
Statistics 66

GENERATION

DREDGE PUMPS ASHES TO STORAGE AREA.....F. B. Wingate 30

SALES

SELL YOUTH ON ELECTRICAL FARMING.....Walter E. Gross 32

LIGHTING

POWER WILL SPARKLE THE SEASON 47

MEETINGS

ASME HEARS REPORT ON ATOM..... 25
PUBLIC POWER CAN BE AVERTED 44

EDITORIAL AND COMMENTARY

Editorials 5
In the Industry..... 62
Technical Notes 62

INDUSTRY NEWS

Electrical Week 6
Current Events 8, 15, 20
News about People 36
Meetings Calendar 43
Manufacturers and Markets... 56

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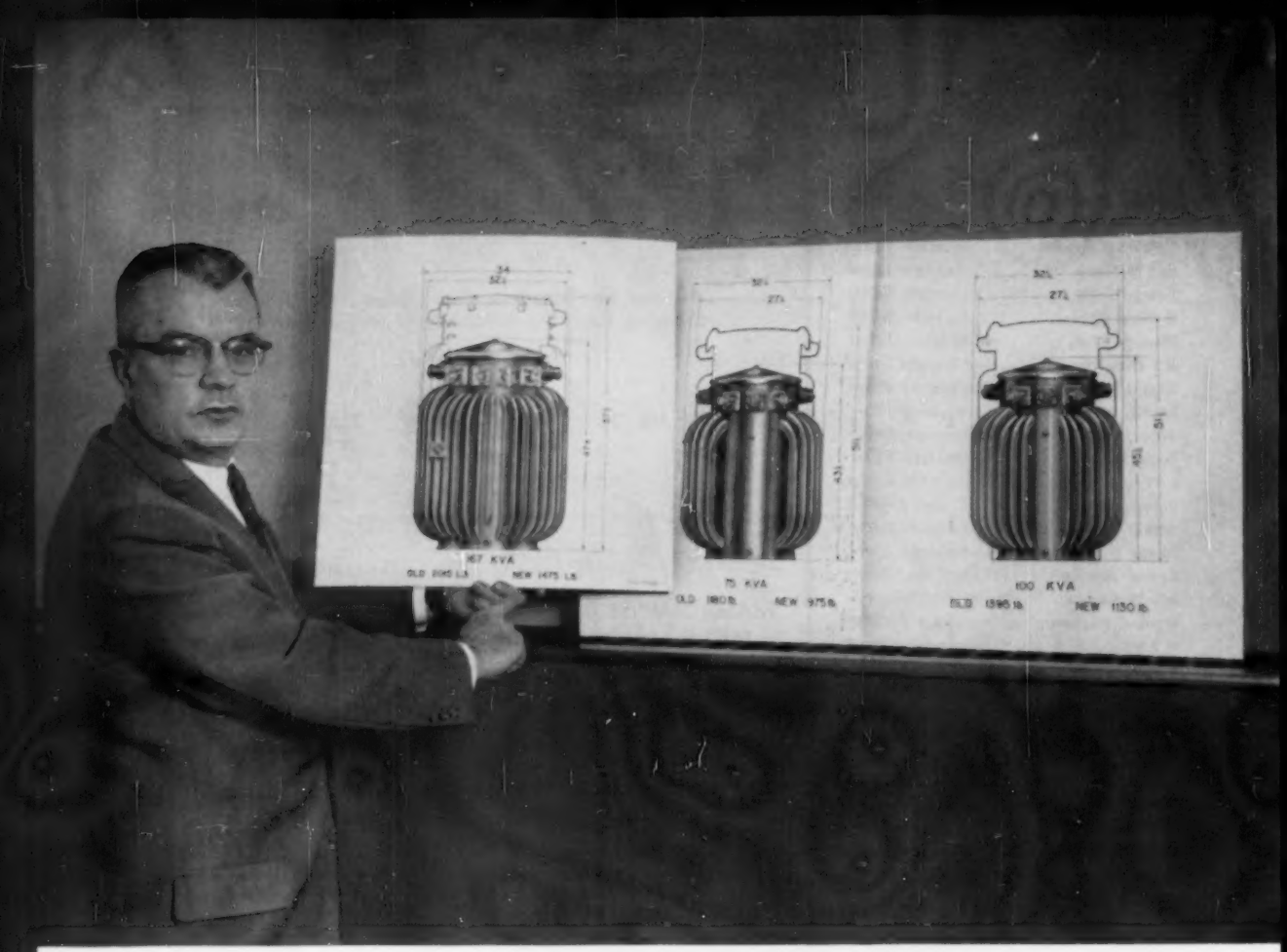
COMING NEXT WEEK—What happened in 1955? What will happen in 1956? The editors will answer both questions in a 16-page section.



W. L. McKeithan, Section Manager, Distribution Transformer Engineering, reveals this

FACT: New pole-type units have low weight where it counts

WEIGHT REDUCTION IN HIGHER RATED TRANSFORMERS			
	75 kva 2400v	100 kva 2400v	167 kva 2400v
Old Weight	1180	1395	2015
New Weight	975	1130	1475
Per Cent Reduction	**17%**	**19%**	**26%**

The new Westinghouse pole-type distribution transformers—75, 100, 167 kva—have been drastically reduced in weight. The 167-kva unit now permits direct pole mounting—and conforms to EEI-NEMA 6th Report Standards. This means easier installation and, quite often, saves change-out to a larger, more expensive pole. Example: 167 kva, 7620 to 120/240 . . . reduced from 2600 pounds to 1515 pounds.

Get more for your transformer dollar—and simplify operating problems—with the new Westinghouse designs.

• • •

Call The Man With The Facts, your Westinghouse Sales Engineer. Or write direct to Westinghouse Electric Corporation, Box 868, Pittsburgh 30, Pennsylvania. J-70740

YOU CAN BE SURE... IF IT'S

Westinghouse

EDITORIALS

". . . Good Will Toward Men"

Shepherds tending their flocks on the hills near Bethlehem listened to the first description of the Christmas spirit, "And on earth peace, good will toward men." The good will—the mutual understanding and respect—of man toward man miraculously pervades the season and kindles our aspirations for a fuller life.

If we are to realize those aspirations, we must find a way to preserve and prolong the spirit of Christmas through the year. We must seek to carry it into our day-to-day affairs as freely and as selflessly as we share the good fellowship at Christmas time.

Thoughtful industry leaders during the year have voiced the need for an increasing awareness of human relationships and the importance of considerate service. There have been pleas for broader cooperation and understanding among various segments of the industry. These, voiced in sincerity, are in keeping with the Christmas spirit.

In areas where ideology and principle are involved there are conflicts which try men's souls. We know that ill-will and ill-feeling exist between men over the question of government and private ownership. We know that the actions of government sometimes seem unjust to all segments of the industry. We know there are sometimes attempts to pervert the good will which the public holds for the industry.

Some of these conflicts are based on the philosophical convictions of men. Some arise from the baser instincts such as greed for authority and political ambitions. Some come more simply from misunderstanding and ill-conceived actions.

But deep as these conflicts may be, they do not overshadow the things the men of the industry hold in common. Love of country and a desire for a fuller, more rewarding life are qualities shared by all. Service in the public interest is a common objective. A basic sense of fair play and a respect for the individual are a part of our way of life.

If we are to have hopes of resolving or rising above the conflicts, we must keep always in mind these areas of common interest. But we must go farther. We must have faith that men of good will can and will find a way of living without bitterness even though they must hold to their deep convictions.

We must strive to carry over from the Christmas season that feeling of good will, respect, and cordiality toward our colleagues in all segments of the industry. We must learn to air our conflicts in an atmosphere of reason and understanding. For name-calling, back-biting—bitterness of all kinds—have no more place in our day-to-day lives than they have at Christmas time.

There is no surer way of gaining and holding the respect of the people we serve, our colleagues, and the nation at large than to keep the spirit of Christmas alive all through the year.

Horace P. Liversidge

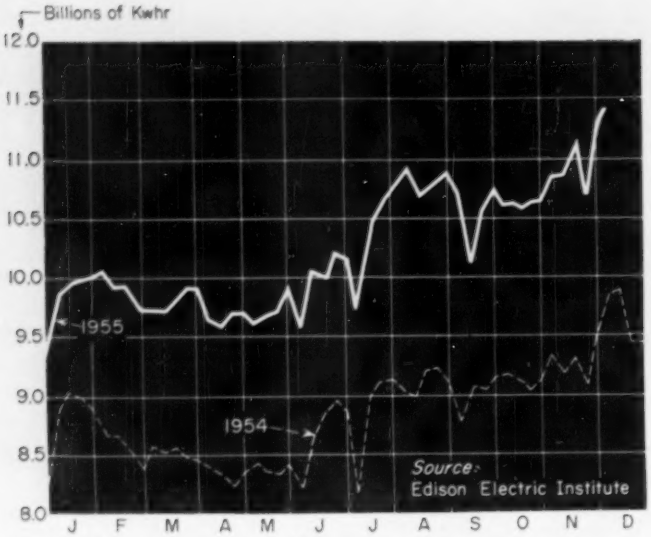
Fifty-seven years with a single company is likely to make one a little weary, perhaps less keen to the developments and problems of everyday operations. A notable exception to this general observation was Horace P. Liversidge, chairman of the board of Philadelphia Electric Co, who died recently (p 38). Beginning with a predecessor company in 1898, he rose to become chief executive officer of the company. He was on the job until the day of his death actively participating in the direction of the financial and operating affairs of the utility.

The same exceptional talent and keen perception which enabled the electric utility leader to win the James H. McGraw Award in 1932 was apparent in recent months. His address before the Pennsylvania Electric Association Sept. 20 of this year was among the most thoughtful given by a utility executive during the year. Observations and conclusions of that address have been referred to on this page several times previously. .

Liversidge, an engineer by training, played a key role in the many engineering achievements which his company pioneered. But his actions and his speeches indicated his active interest in the sales side of the industry.

During his last days Liversidge was hard at work on a lecture he was to have delivered late this month at the Franklin Institute in Philadelphia. His topic was "The Social and Economic Contributions of the Development of Electric Power." Few men in the industry could discuss this topic so well. Horace Liversidge's life was devoted to the development of electric power. Many of the contributions were his own.

ELECTRICAL WEEK



OUTPUT

Week Ended Dec. 10
11,426,000,000 Kwhr
Up 16.0%

Atomic Energy Commission requirements — 1,098,000,000 kwhr (Electrical World estimate). Excluding AEC, output increase was 10.9%

Per Cent Change From Previous Year

	Total US	New Eng.	Mid. Atlan.	Cent. Ind.	West Cent.	South-east	South Cent.	Rocky Mount.	Pacific NW	Pacific SW
Dec. 10	+16.0	+9.7	+8.6	+25.3	+12.4	+15.5	+12.6	+13.8	+19.1	+12.7
Dec. 3	+18.2	+9.3	+10.9	+28.6	+14.7	+19.4	+14.0	+13.9	+18.9	+10.9
Nov. 26	+18.0	+11.4	+9.2	+27.3	+10.4	+18.3	+15.7	+16.4	+25.2	+15.0

Seasonally Adjusted Index 210.9 Week Ago 211.7 Year Ago 181.9

The Issue's Highlights—Carolina Power & Light signs contract with Southeastern Power Administration to wheel 30,000 kw from Kerr Dam to co-ops . . . New York Power Authority will build own transmission line to deliver St. Lawrence power to three customers; two utilities will participate in transmission arrangement . . . Mississippi Valley Generating sues government for $3.5 million to cover expenses incurred on West Memphis, Ark., plant before contract cancellation . . . Con Edison finds periodic health examination effective in guarding executive health.

Crazy Dam Building—Robert Yellowtail, member of Indian tribe seeking payment for lands to be flooded by Bureau of Reclamation's proposed $40-million, 200,000-kw Yellowtail project on Big Horn River in Montana, makes this comment: "Congress should be ordered to halt this crazy dam building until such time when there is a clear need for additional food production brought about by a population increase." Proposed dam, he added, is "pork barrel project which will add 50,000 acres of new land to help boost the food surplus now facing the country."

Company Changes—A. B. Chance Co has purchased 51% of stock of Porcelain Products Co, manufacturer of high-voltage insulators and other porcelain products . . . Capital assets of Midvale Co of Philadelphia, one of the four suppliers of steel forgings to electrical manufacturers, has been acquired by new corporation, the Midvale-Heppenstall Co. Non-voting preferred stock of the new company has been purchased by Allis-Chalmers, Westinghouse, and General Electric.

From the South—West Memphis, Ark., is studying possibility of building municipal power plant. City's current peak demand is about 5,500 kw . . . Citizens for TVA, Inc, has elected Mayor Leonard Beard, Sheffield, Ala., as its new president.

NAEC Board Elects Director—Arthur R. Barnett is the new director and a vice president of National Association of Electric Companies. He was elected at last week's board meeting. Robert Litschert was elected secretary-treasurer. Board also approved reduced budget for coming year.

NEWS OF THE INDUSTRY BRIEFLY TOLD

Washington Wire—Babcock & Wilcox has been awarded first lump-sum contract for fabrication of reactor fuel elements for atom plants. B&W will make 325 fuel assemblies for AEC's materials testing reactor at $279 each. AEC said award will free its fuel element manufacturing facilities at Oak Ridge for other work . . . FPC has eased requirements for retaining electric utility records. Effective Jan. 1, new order reduces time limits for holding files in some instances, permits micro-filming in others . . . U. S. Supreme Court has rejected California's effort to involve four other upper Colorado River basin states in its water rights fight with Arizona. Move may remove last serious barrier to quick Congressional vote on Administration-backed Upper Colorado Water Storage Project.

Labor—Westinghouse back to work movement approached 2,400 in six plants last week, and company reported 78 carloads of merchandise shipped from Mansfield, Ohio. Some pickets were arrested for disorderly conduct. Meanwhile, Pres James B. Carey of IUE-CIO at New York press conference called for special meeting of Westinghouse stockholders to review management of company's affairs in the labor dispute.

New Appointments—Colin W. Raff, Montana Power, has been named PIP Workshop Conference Committee chairman for next year. PIP conference will be held in Chicago in September . . . Westinghouse Electric has elected John W. Craig vice president and general manager of its electrical appliance division. He succeeds John H. Ashbaugh who remains as vice president and special consultant to Chris J. Witting, recently appointed vice president of consumer products group.

Pacific Northwest News—Eugene (Ore.) Water & Electric Board has ordered rate reduction of 8 to 10% for commercial, residential, and industrial customers to meet competition outside its corporate limits . . . At its next meeting, Jan. 10, board will consider Superintendent Ray Boals's recommendation that it withdraw from Northwest Public Power Association. For months split has been brewing between NPPA and municipalities over NPPA's political activities.

EEI President's Conference—More than usual militancy was evident in discussions of federal power battle at last week's meeting in New York. Pres Kinsey M. Robinson, Washington Water Power, fresh from his victory in Stevens county, spoke, and his successful fight was widely endorsed.

ABOUT PEOPLE IN THE INDUSTRY

Carolina P&L has always stood ready to wheel Kerr Dam power to co-ops despite charges to contrary, says Vice Pres H. B. Robinson. But Kerr Dam alone has insufficient energy, he notes. "Our company has insisted that nothing in Flood Control Act authorizes Sepa to purchase such power. We did not feel that we should put government into business in direct competition with us. In contract as finally drawn (p 8), we will sell directly to customers whatever company-generated electricity is required."

Nuclear power reactor costs may turn out to be less than anticipated. Dean John R. Dunning, Columbia University School of Engineering, last week told Nuclear Engineering and Science Congress in Cleveland, "Actual cost of most reactors now in operation has usually been less than engineering estimates. Should this same relationship hold true for proposed power reactors it could have a significant effect on when nuclear power will be economical." He also was optimistic about solving waste disposal problem.

More News About People page 36

CP&L Will Wheel Kerr Dam Power

- **Utility signs contract with SEPA to supply 30,000 kw to co-ops in the area**
- **Arrangement in accord with Attorney General's recent Clark Hill opinion**
- **Clark Hill power controversy is expected to be settled along similar lines**

Carolina Power & Light Co will wheel 30,000 kw of power from the 204,000-kw John H. Kerr Dam on the Roanoke River to North Carolina preference customers under a contract the company has executed with Southeastern Power Administration.

The contract, which has been under negotiation for several years, includes the following provisions:

- The 30,000 kw will be wheeled over CP&L lines at a price of 7 mills per kwhr to the co-ops. Wheeling fee, which will be absorbed by SEPA, runs 1 mill per kwhr, up to 100 miles, 1.5 mills per kwhr up to 150 mi.
- Wheeling is limited to 165 mi from the dam, an area within CP&L's service radius.
- CP&L will buy about 27,000 kw of the dam's output direct from SEPA, also at the 7-mill rate. Under an Aug. 8, 1952, contract, two-thirds of the dam's output is purchased by Virginia Electric & Power Co; 60,000 kw of this is wheeled by Vepco to co-ops in its service area. About 170,000 kw is dependable energy; the rest is secondary and dump.
- CP&L will supply firming energy to co-ops which do not own generating facilities at 4.5 mills per kwhr. Vepco already does this.

SEPA's Income from CP&L

SEPA, which markets power from the Corps of Engineers dam, estimates it will realize an average annual revenue of $1.3 million from sales to CP&L and the North Carolina co-ops. This does not take into account sales to Vepco and cooperatives in its service area.

The Interior Department said applications for power from preferred customers in CP&L's service area far exceed the 30,000 kw being made available to them; they have been piling up for years. Officials said because of this it was necessary to divide the 30,000 kw among the applicants on the basis of their maximum purchase from CP&L last year. The co-ops had been buying necessary power from CP&L while the contract was under discussion.

Interior also said it is disposing of the power from Kerr Dam under Section 5 of the Flood Control Act of 1944. Apparently the disposal is also being accomplished in accordance with the Attorney General's recent opinion on disposal of Clark Hill Dam power in Georgia.

That opinion, dated July 15 and disclosed during hearings before the subcommittee of the House Government Operations committee on Oct. 11, said Interior could not sell the 140,000 kw of Clark Hill capacity earmarked for Georgia to the Georgia Power Co without first offering it to Georgia co-ops for direct sale.

Interior has now offered to sell Clark Hill power direct to co-ops in the Georgia Electric Membership Corp, and Georgia Power is going along with a wheeling agreement. This contract is still being negotiated; it is expected to be similar to the Kerr Dam arrangement just worked out.

N.Y. State Unit to Build Line

. . . to transmit St. Lawrence power; utilities approve revised plan for Power Authority line, will help deliver from project

New York State Power Authority, with agreement by two New York utilities, has approved a revised program for construction of its own transmission line to deliver St. Lawrence River power to three customers.

The two utilities, Niagara Mohawk Power Corp and New York State Electric & Gas Corp, had opposed the original plan which called for construction of the state-owned transmission line to deliver power to the city of Plattsburg, Plattsburg Air Force Base, and the state of Vermont (EW, Oct. 24, p 10).

The revised $6,450,000 program, which would involve an expenditure of $5,225,000 by the Authority, calls for erection of a new 230-kv line from Massena to the Vermont state line near Plattsburg. The two utilities plan to spend approximately $1,225,000 for strengthening their transmission lines in this area and for stand-by and supplemental service to the authority customers to be served by the new line.

Under the plan, 140,000 kw would be carried to the three customers from the Barnhart Island generating plant. The Authority's line would handle about 90% of the power. It would carry all the power allotted to Plattsburg and the Air Force base and 80% of the power for Vermont.

According to Robert Moses, Authority chairman, the utilities would be paid "a transmission charge to be fixed by contract on the basis of a fair return on capital investment."

Utilities Opposed First Plan

The Power Authority had originally planned construction of two parallel lines to the Vermont border to guard against line breakdowns. But at a recent public hearing in New York City, the utilities requested authority to construct the Massena-Plattsburg line and to strengthen their facilities. This would be the "most economical and most reliable method," claimed Lauman Martin, vice president and general counsel for Niagara Mohawk.

Martin contended at that time that under the utilities' plan, cost of delivery of the 140,000 kw would be 2.736 mills per kwhr, compared to 2.971 mills under Authority's plan. "The annual direct saving to all consumers would be $250,000," he said.

Before transmission plans were recently revised, New York State E&G also threatened to contest the legality of the State Authority line. And when

the line first came up for consideration one of the members of the Authority had opposed it on grounds that it violated the law under which the Authority operates. That law, the opposing member pointed out, states that existing private transmission lines must be used whenever available.

The revised plan calls for rebuilding of New York State E&G's existing line from Lyon Mountain to Plattsburg for use at 115 kv.

Niagara Mohawk also plans to extend its existing interconnected 115 kv transmission system by constructing new 115-kv lines and transformer facilities from Whitehall, N. Y., to the state line near Rutland, Vt., and from North Troy, N. Y., to the state line near Bennington, Vt. In this way, 100,000-kw of St. Lawrence power can be delivered to Vermont at three points, over any two of which full delivery can be made.

Engineers for the Power Authority and the utilities have agreed that the new plan is "the best and most economic that can be provided," according to a statement issued by Niagara Mohawk. The statement added that "the program utilizes to the fullest extent existing facilities of the two utilities for delivery of St. Lawrence power to the three Authority customers."

PUD Accepts FPC Okay for Priest Rapids Project

The Grant County PUD of Ephrata, Wash., has formally accepted a Federal Power Commission license to construct Priest Rapids and Wanapum Dams on the Columbia River but has refused to consider the request of five chambers of commerce that it include a $300,000 access road in the $356-million project.

The license specifies that work on Priest Rapids Dam must be completed by July 1, 1960, with another two years allowed for the Wanapum structure. The PUD expects to call Priest Rapids construction bids in late January and start work next summer.

The road request came from the chambers of commerce of Ephrata, Moses Lake, Warden, Quincy, and Soap Lake, after Grant County declared it had no funds for a road to the dam site. PUD officials declared they were "not in the road-building business."

Dixon-Yates Sues Government

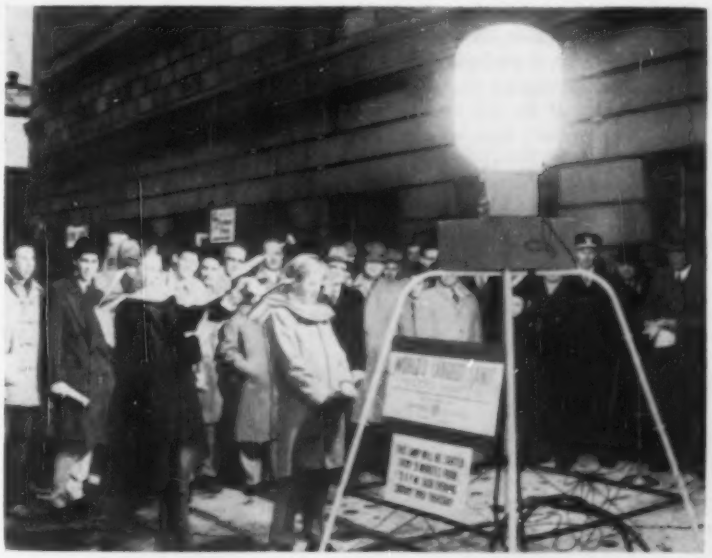
Mississippi Valley Generating Co last week sued the United States government for over $3.5-million expenses involved in the cancellation of its contract to supply power to the Atomic Energy Commission at West Memphis, Ark. The complaint was filed in the U. S. Court of Claims.

Commenting on the court action, Edgar H. Dixon, president of MVGC and of Middle South Utilities, Inc, partners with the Southern Co in MVCGC, stated:

"The decision of the government to repudiate its contract presumably was based upon a legal opinion which rests upon important mistakes of fact, and we disagree with its conclusions. We will prosecute our rightful claims with the same vigor which characterized our efforts to fulfill our part of the contract."

"This contract," Dixon declared, ". . . was in full force for more than six months and during that time we proceeded with the performance of all our obligations under it. In addition numerous contractors, manufacturers, suppliers, and professional people worked hard and diligently and spent substantial sums of money on this project. . . . we commence this litigation with every confidence in its result."

Largest single expense listed in the petition is $1,208,743 to Westinghouse Electric Corp for the order of turbine generators and accessories.



Atomic Congress Opens in Cleveland

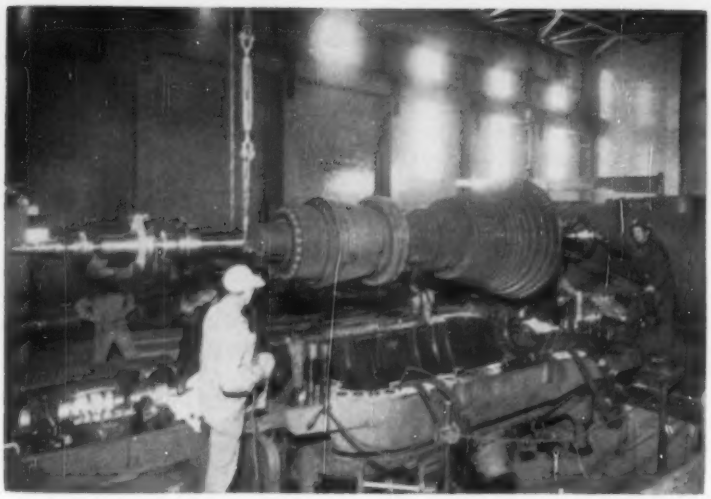
A light bulb, reportedly the world's largest, was lit last week to open the International Atomic Congress and Exposition in Cleveland.

At opening-day ceremonies Sam Little, 13, flourished an atomic pistol (above) to signal lighting of the bulb. Sam is a descendant of Paul Revere who was also a lamp lighter.

The Nuclear Engineering and Science Congress is sponsored by leading engineering societies and related scientific bodies. Members of the congress were told at a dinner meeting that the safety of nuclear power plants had resulted from the recent tests.

Dr Clarence E. Larson, former director of Atomic Energy Commission's laboratory at Oak Ridge, described details of two tests conducted by the AEC. At present Larson is vice president in charge of research at National Carbon Co, a division of Union Carbide & Carbon Corp which operates some of AEC's major installations.

In both tests, Dr Larson said, the reactors were allowed to get out of control and no serious damage over an appreciable area resulted.



Labor Dispute Ends at Duquesne Light

Settlement of a jurisdictional dispute between hoisting engineers and electricians engaged to assemble a new turbine has been secured by Duquesne Light Co. Rotor is shown above being lowered into the new 150,000-kw turbine now being installed at the utility's Phillips Power Station.

Work stoppage because of the jurisdictional strike began in late August, delaying erection of the new unit for several months. Date to start operation of the turbine has now been set for Jan. 15, 1956.

Seattle Wind Storm Fells Power Poles

High winds, reported as whole-gale force, felled power poles in Seattle recently. An automobile, smashed by a toppled pole carrying high voltage lines and a heavy transformer, is shown above.

Five more cars also parked near Eighth Ave and Myrtle St were damaged by other poles which were whipped down in the wind storm. One automobile caught fire from short-circuited wires. Power to eight industrial plants in the area was knocked out by the 68 mph winds.

Damage to homes and automobiles by falling trees and poles was reported throughout the city. And power failures occurred in Southern Snohomish County, Mercer Island, Medina, and Beaux Arts. At Evergreen Point the wind snatched a seaplane from its moorings and hurled it across Lake Washington into a Kirkland dock where it sank.

Colorado Co-ops Split over Power Plant Site

Colorado-Ute Electric Association, a combination of four western Colorado rural electric cooperatives, has split in a disagreement over the site for a power plant to be built with a $10-million loan approved by the Rural Electrification Administration.

Directors of the La Plata Electric Association at Durango and the Empire Electric Association at Cortez have voted to withdraw from Colorado-Ute if it goes ahead with an announced plan to build the plant at Nucla.

The Durango and Cortez co-ops also demanded the resignation of Frank Meaker of Montrose as head of Colorado-Ute. The Durango-Cortez directors attacked Meaker for his recent charge that Colorado-Ute had been forced into a "shotgun wedding" with Western Colorado Power Co, a private company which has contracted to operate the new plant for the co-ops.

The two associations ripped Meaker "for his shotgun wedding charge, which we believe is entirely unfounded."

Meaker replied that he had no intention of resigning and pleaded for harmony among the four co-ops.

VEPCO President Dies

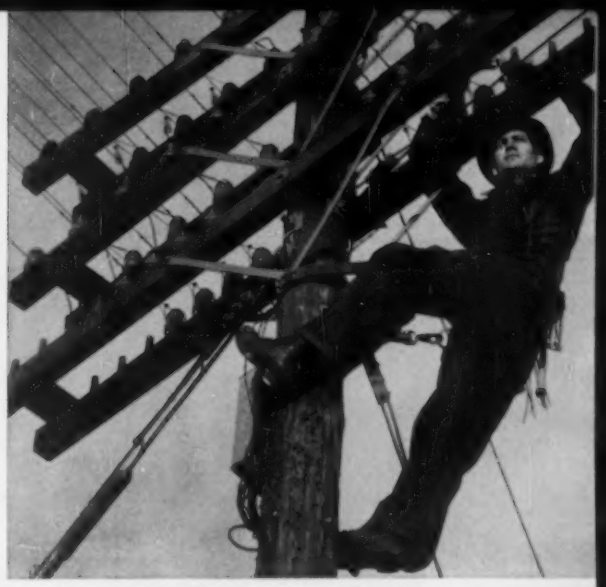
Jack G. Holtzclaw, president of Virginia Electric & Power Co since 1929, died of a heart attack last week in Richmond. He was 69 years old.

Upon graduation from Georgia Institute of Technology as an electrical engineer, Holtzclaw joined Savannah Electric & Power Co, and later was named chief executive of the electric light and power and traction properties of Pensacola (Fla.) Electric Co.

In 1925 he was appointed general manager of Eastern Texas Electric Co with headquarters in Beaumont. When Gulf States Utilities Co was organized in 1926 to take over the Beaumont properties, he was retained in an executive capacity. He remained with the utility until his election as president of Virginia E&P.

Now!

pole line hardware that lasts as long as a creosoted pole

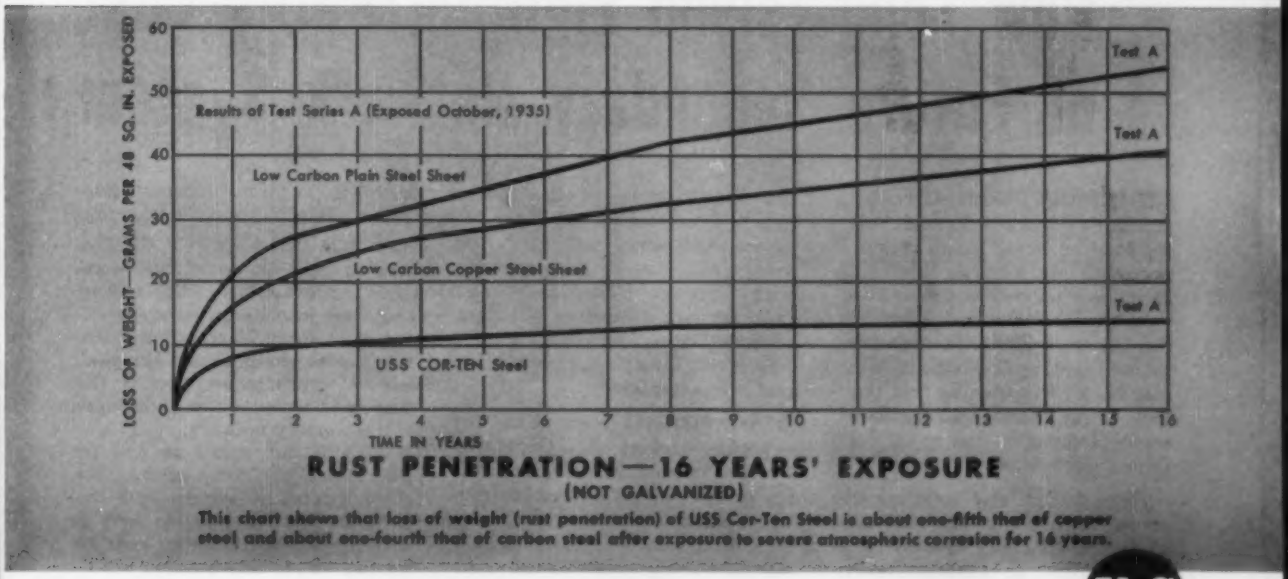


AT LAST there's a solution to the problem that has been the scourge of utility company maintenance-budgets for years. Now, galvanized pole line hardware made from USS Cor-Ten Steel will last the full life of a pressure-creosoted utility pole *without replacement*. This extended service life means tremendous savings . . . particularly since labor costs for replacements far exceed the actual cost of hardware.

USS Cor-Ten supplies this needed EXTRA life primarily because it has 4 to 6 times the resistance to atmospheric corrosion of plain carbon steel. (The chart shows what this means in reducing rust penetration.) Cor-Ten's second line of defense is the fact that it has a 50% higher yield point than carbon steel, meaning that hardware made from Cor-Ten can wear *much* thinner than carbon steel and still do the job without need for replacement.

With the increasing demand for utility equipment that delivers maximum service at lowest possible cost, it will certainly pay you to specify that your next shipment of pole line hardware be made from rugged USS Cor-Ten High Strength Steel.

UNITED STATES STEEL CORPORATION, PITTSBURGH · AMERICAN STEEL & WIRE DIVISION, CLEVELAND · COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
NATIONAL TUBE DIVISION, PITTSBURGH · TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. · UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK



RUST PENETRATION—16 YEARS' EXPOSURE
(NOT GALVANIZED)

This chart shows that loss of weight (rust penetration) of USS Cor-Ten Steel is about one-fifth that of copper steel and about one-fourth that of carbon steel after exposure to severe atmospheric corrosion for 16 years.

USS COR-TEN High Strength STEEL

UNITED STATES STEEL

MUSHROOMING LOADS like this all-air-conditioned department store at a new Levittown shopping center have created a load growth problem for the Long Island Lighting Company.

How Long Island Lighting Pares Cost of Future Secondary Network System

TREMENDOUS EXPANSION of both residential and commercial building load on Long Island makes it necessary to plan far ahead. A secondary network seems to be inevitable in some of the newer commercial areas serviced by the Long Island Lighting Company of Mineola, N. Y. Recognizing this problem, Long Island Lighting is already planning on how to cut costs of its *future* network system.

Even though new areas are still served by a radial system, the utility is installing G-E *network* transformers to handle concentrated loads in new shopping centers, like the all-air-conditioned department store at Levittown. When a secondary network becomes necessary, many of the vaults will already be equipped with network transformers and only network protectors will have to be added . . . giving a considerable saving on ultimate installation and rearrangement.

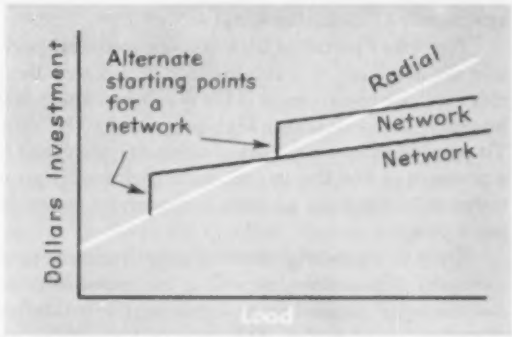
OTHER BENEFITS come from this advanced planning. Congested overhead wiring is eliminated. Better service continuity results from underground service. Greater dependability is obtained from submersible G-E network transformers . . . with their new panel-type radiators that minimize corrosion and facilitate maintenance, and particularly cleaning and repainting.

HELP FOR YOUR SYSTEM. If you are planning to meet continued load growth with a radial system and your load density can be expected to reach 50 to 100 kva per 100 feet of street within the next ten to fifteen years, now is the time to investigate the advantages of a secondary network.

G-E district engineers will be glad to help you compare the costs of your present system and the potential savings possible with a network. For full details, write to Section 435-9, for Bulletin GET-2432. General Electric Company, Schenectady 5, N. Y.

FUTURE CONVERSION TO NETWORK SYSTEM is facilitated by the installation of this G-E network transformer with "panel-type" radiators. When the secondary network system becomes a reality, the only additional equipment necessary will be the installation of network protectors.

PLACED IN AN HOUR under the shopping-center parking lot, this 1000-kva 13,200–216Y/125 unit can weather submersion if lot should become flooded.



IT PAYS TO START A NETWORK. Future increases in capacity require less investment with a network. The sooner it is started, the lower the ultimate cost.

Progress Is Our Most Important Product

GENERAL ELECTRIC

THIS IS A PORCELAIN BUSHING FOR A 230 Kv PRESSURE-TYPE POTHEAD

This is a one-piece porcelain, 101¼" long, 20½" in its widest diameter, and weighs 827 pounds. Its ends are ground, as are the conical end sections, for gasketing. The sand bands provide for attachment of mounting flanges.

Not many pieces of high-voltage electrical porcelain are produced in a single piece of this size. But in this case, the requirement is for more than a porcelain housing. This unit seals a high-pressure 230 Kv cable. To provide adequate factors of safety, it is designed for a pressure of 800 lbs. per sq. inch; each unit is proof-tested at 500 lbs. per sq. inch, and operates at 250 lbs. per sq. inch.

Only by knowledge built of experience—as to the strengths of porcelain, as well as its limitations—is a manufacturer justified in undertaking the production of such a design as this. At Lapp, that knowledge, and that experience, exist. It's evident in the proficiency with which Lapp adapts its regular production techniques to each new special requirement. It's reflected in the enthusiastic confidence with which Lapp meets so challenging an assignment.

It's a sound basis too, for the confidence of power companies the world over who have found in Lapp insulators—and Lapp "special porcelain" for system equipment—an extra margin of operating security, long life and low upkeep.

Lapp Insulator Co., Inc., Le Roy, N. Y.

Lapp

PNP Okays More Funds for Work on Snake Dams

Pacific Northwest Power Co has authorized another $500,000 to continue exploratory work on the Pleasant Valley and Mountain Sheep Dam sites on the Snake River, according to President Kinsey Robinson.

The added funds will provide for major fish studies, archeological investigations on the reservoir areas, and other engineering work, including survey of access roads into the remote Snake River area.

It brings to $1,750,000 the total funds appropriated by four of the region's power companies to prepare for construction of the $210-million project, designed to help provide badly-needed power for the Pacific Northwest.

Pacific Power & Light, Portland General Electric, Washington Water Power and Montana Power companies formed Pacific Northwest Power.

Application for license to build and operate the 1,446,000-kw Pleasant Valley-Mountain Sheep project is pending before the Federal Power Commission.

Construction schedules call for starts at both dams next March with first power available in 1959. The project would be second only to Grand Coulee as the largest hydro development in the Northwest.

Authorization of the additional half-million dollars was made at a recent meeting of the generating company's board of directors at Spokane.

Utilities Stand Neutral in Clash of Arizona Cities

Two big utilities have refused to take sides in an annexation feud between the neighboring towns of Phoenix and Scottsdale, Ariz.

Arizona Public Service Co joined with the Mountain States Telephone and Telegraph Co in avoiding the contest between the towns—battling for an 8.5-mi residential strip in "no-man's-land" which lies between their borders.

Both utilities endorsed Phoenix's move, but refused to sign petitions.

Said William R. Reilly, Arizona Public Service vice-president, "We have signed petitions for other Phoenix annexations . . . where there is no controversy, we are glad to sign."

WESTINGHOUSE VICE PRES A. C. MONTIETH PRESENTS AWARD

Power Suppliers Confer

. . . as National 4-H Congress meets; farmers urged to shake off government controls; Westinghouse presents 4-H awards

Removal of government controls in the agricultural industry was urged by Duane Arnold, vice president and general manager of Iowa Electric Light & Power Co, at the Power Suppliers Conference held recently in conjunction with the National 4-H Club Congress in Chicago.

In addition to sponsoring the conference, Westinghouse Electric Corp presented scholarship awards to 4-H Clubbers. The conference was attended by almost 100 rural service representatives of private utilities and rural electric cooperatives.

Speaking at a luncheon meeting, Arnold declared that government controls must be removed before the agricultural industry can re-establish its self respect. And in order to remove controls, he added, federal supports must be eliminated. He urged farmers to create demand for their products and not to depend on the food industry to do it for them.

E. D. Smith, Dayton Power & Light Co, in outlining his company's rural program, pointed out that it had been developed after a survey to determine the area's needs. The program, he said, had benefited public relations, aided development of the area, and increased revenues for the company.

Tying in with the 4-H meeting, a conference panel representing four utilities and one cooperative described work being done in summer camps to stimulate interest in the electrical field. Another panel, stressing the need for trained leaders, outlined how power suppliers could help develop leadership in the nation's youth.

Winners for the Westinghouse awards for farm and home electric projects totaled 41—33 boys and 8 girls. All received an expense-paid trip to the Congress. And six of these received a $300 scholarship each as well.

PG&E Plans New Unit

Pacific Gas & Electric Co has applied to California Public Utilities Commission for authorization to build a $21-million, 165,000-kw addition to its generating plant at Hunters Point, San Francisco peninsula load center. The new unit, fourth to be installed at the plant, will bring total plant capacity to 427,000 kw upon completion in 1958, and will make the station fourth largest power plant in the PG&E system.

Executive Health: How to Protect It

MANAGEMENT
Industrial Relations

Con Edison analyzes its experience with the periodic health examination, finds its cost justified despite certain limitations

S. CHARLES FRANCO, MD, FACP, Consolidated Edison Co of New York, Inc. New York, N. Y.

Interest in executive health has gone hand in hand with the marked increase in the so-called "degenerative diseases" which have become the leading cause of death in our generation.

The unexpected death of a top executive can provoke a crisis in the operation of a company, and enlightened self-interest on the part of management has raised the question, "Is there anything that we can do to prevent this type of catastrophe?" This has led to various types of company-sponsored programs which have come to be known under the broad category of Executive Health Examinations.

We are all aware that in our present society there has been a trend toward an aging population which has resulted in an increase in the degenerative diseases which are the natural companions of increasing age. Despite the purported unusual strains to which an executive is said to be exposed, there is no concrete evidence that there is any difference between the health status of top executives and rank and file employees.

The degenerative diseases primarily affect the heart and arteries (cardio-vascular diseases) and they often are associated with blood pressure and arteriosclerosis or "hardening of the arteries". When arteriosclerosis involves the arteries of the heart, it is known as coronary artery disease and is the cause of angina pectoris and the "acute heart attack" or coronary thrombosis.

Next to cardio-vascular diseases, cancer is the greatest cause of disability and death. This is in marked contrast to the turn of the century when infectious diseases headed the mortality list. Diabetes and mental diseases are also on the increase although they are not adequately reflected in the mortality tables. The adverse effects of overweight in relationship to cardio-vascular disease, diabetes, cirrhosis of the liver, appendicitis, and gallstones have also been demonstrated.

Diseases Start Insidiously

It should be recognized that the degenerative diseases have their inception early in life, in the 30's and 40's, and their course is insidious until the fully developed disease produces its symptoms in the 50's and 60's. When the disease progresses to this stage, it is often too late to obtain a cure and the best that can be hoped for is retardation of the illness and amelioration of the symptoms. The same insidious onset is often noted in mental illness, diabetes, and many other medical conditions. Even cancer which has a shorter duration than these illnesses is recognized to have a latent phase during which it produces few, if any, symptoms.

Early Detection Important

It should be evident that the early detection of insidious disease is the best means of preventing chronic illness. We must ferret out and treat these diseases at ages 35-50 if we are to have good health in our later years. This approach to the prevention of disease has been described as "constructive medicine."

The available medical facts indicate that any discussion as to the level of management to which executive health program should be extended is purely academic. It would seem advisable that executive development programs include the periodic health examination of potential candidates. As a matter of fact, pre-employment examination in the age group 20 to 30 years usually will not reveal any indication as to the health status in

CHART SHOWS SIX BASIC STEPS IN PERIODIC HEALTH EXAMINATION

later years. Periodic re-examination is the key to health maintenance.

The shortcomings of the periodic examination have raised some question as to its real worth, but accumulated experience testifies to its value despite its recognized limitations. The yardstick by which the effectiveness of such a program can be measured is based on purely medical findings, that is, the diagnosis of disease, particularly unsuspected or incipient disease and the follow-up study to determine which conditions were corrected, which were improved, those which were unchanged, and those in which failure was experienced. These medical facts can be translated into administrative terms of time, cost, and savings in dollars and skills.

Con Edison's Experience

The periodic examination program for the executive group was inaugurated at Consolidated Edison Co of New York in 1949. Over 5 years, 648 men out of 954 who were eligible availed themselves of the facilities offered. The majority of the examinations were on an annual basis. Participation in the program was voluntary and mainly included men in the age group 40-65 years of age, ranging from assistant foremen and supervisors to plant superintendents, managers, and top executives.

The cost of the program was met by a joint contributory plan which now amounts to $24 a year to the individual concerned. Our experience with this particular group revealed no difference in the relative health status at comparable ages between top executives and those in lower level jobs. The results of the examinations were kept confidential and were transmitted to the individual and his medical advisor. Medical and surgical treatment was largely in the hands of private physicians and hospital facilities.

Features of Examination

The periodic health examination has certain distinctive features. It is more comprehensive than the ordinary examination which is undertaken when one has a presenting complaint about his health. The physician tries to evaluate "the whole man," his work and home conditions, his ancestry, his previous history, and his reaction to the stress and strain of everyday life.

There has been some question as to who should perform the periodic examination. Some feel that the family physician is in the best position to conduct the examination because in many instances he would have an intimate knowledge of the personal background of the individual. Others, think that a physician specially trained in diagnostic medicine is most qualified to undertake such an examination. However, the medical profession has not been able to sell such a program to patients, and perhaps this is the greatest reason why industry, in large corporations at least, has undertaken periodic examination programs.

In the personal history can be unearthed the clues to possible hidden illness. A review of the diet, work environment, and habits gives the physician an understanding of the personality of his patient. The family history can at times provide information concerning tendencies towards diabetes, high blood pressure, pernicious anemia, and cancer and thus serves as an indication for further laboratory studies to help uncover any hidden tendencies towards these diseases.

At the termination of the examination, the significance of the findings is discussed with the person examined. This seems to be best accomplished by the physician who has personally conducted the examination. Experience shows that health counselling is the most important part of the periodic examination because it gives the best

Rules for Good Health

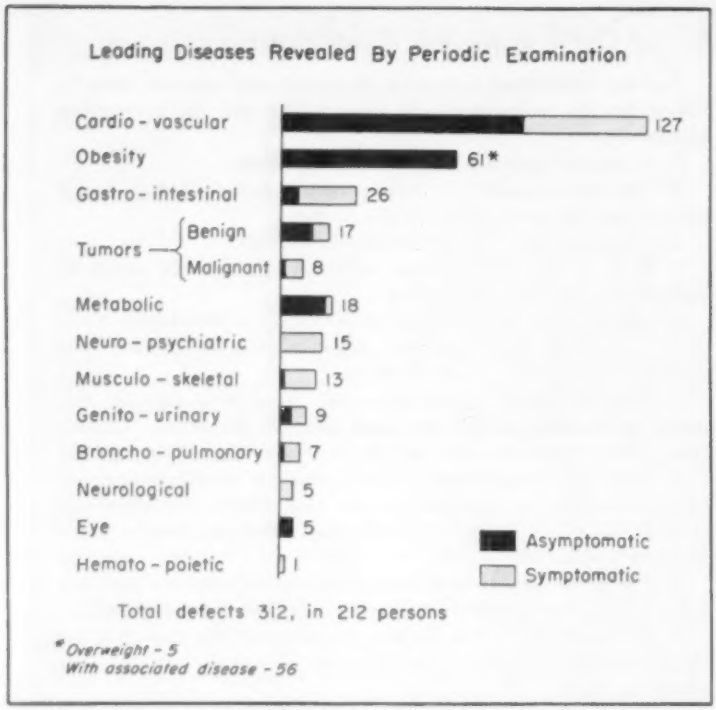
For the individual executive there are two general rules to follow for the maintenance of good health and the prevention of illness:

1. A regular periodic physical examination.

2. The development of good habits, a balanced diet, and a proper attitude towards every-day living.

In addition, these factors should be noted:

- **Many of the illnesses that afflict people are the result of indiscretion in diet and habits.**
- **Obesity that results from over eating is frequently associated with high blood pressure, heart disease, premature hardening of the arteries, and diabetes.**
- **Overindulgence in tobacco and stimulants can be followed by a train of digestive and nervous disorders. Underlying these abuses of diet and habit is chronic nerve tension.**
- **Some physicians are convinced that the condition of overwrought nerves, so common in our competitive industrial society, is directly responsible for the majority of the degenerative diseases and mental illness.**
- **The development of proper attitudes towards life and the job is recognized as the best aid to combat chronic nerve tension.**
- **The realization that no one is indispensible and that we should not take ourselves too seriously is a good attitude with which to start.**
- **For those in positions of responsibility the delegation of tasks to others not only relieves them of annoying details but also serves to develop the ability of subordinates and builds a strong team of loyal workers who then have a sense of participation.**
- **For the majority who work in the ranks, appreciation for the feelings of others and the performance of a good day's work will give added meaning in everyday living.**
- **It is necessary to keep an open mind. Prejudice of any kind serves to confuse good judgment.**
- **After work allow time for relaxation, and above all do not bring the job home with you as a regular thing.**



THIS ANALYSIS IS BASED ON 648 PERSONS EXAMINED IN CON EDISON

opportunity to correct errors of habit and diet which seem to play some role in the development of the degenerative diseases. This is a good time for the physician to give advice about mental health and outline a program for reasonable living to each individual, even those with normal findings.

The follow-up examination to check on correction of defects is important. Equally important is the establishment of a health consciousness so that the individual does not delay in seeking medical advice in the event of development of new symptoms. This was particularly evident in this study among those individuals who subsequently developed some type of cancer.

What Examination Achieves

The main question that has to be answered is' "Just what do we expect to accomplish from the periodic examination of an apparently healthy person or at least one who is working every day?" Our experience at Consolidated Edison indicates that the benefits of the periodic examination are very tangible.

In a period of 5 years, 648 persons, 66% of those who were eligible, were examined. This group comprised men, the few women are not included in this review, mainly from ages 40-65; with more than 85% in the span from 45-65 years. About half of these individuals had conditions of major medical significance in themselves or as precursors of potentially serious disease.

Some of the group knew of certain conditions which they wished to have checked by the examining physician, but a sizeable number of those examined, in fact 33% had conditions revealed to them for the first time. This was even more impressive when it was noted that more than half of these conditions were without symptoms of any kind.

A summary of the leading diseases revealed by periodic examination indicates that the cardio-vascular system was most frequently involved. The cardio-vascular lesions increased with advancing age, reaching their peak in the group 55-59 years of age. The association of increased weight with cardio-vascular disease was evident in many cases.

Further proof of the value of periodic examinations is indicated by the fact that of the medical conditions revealed by examination, 17% were entirely corrected and 31% were improved by treatment. In addition, in almost all of the 34% whose condition remained unchanged, medical supervision enabled these individuals to carry on their usual business activities without any harm.

Examination Shortcomings

It is important to realize that there are certain shortcomings to the periodic health examination program such as:

1. Time and cost factor.

2. Failure to uncover malignant disease.

3. Inability to diagnose coronary artery disease until fairly advanced changes have occurred.

To reduce the time and cost factor in the periodic examination program the following are recommended:

1. Expedite examination procedure by the preliminary accomplishment of a few basic laboratory studies and an electrocardiogram so that the examination can be accomplished in one session.

2. Make the examination a personalized one. The time spent on a detailed history will yield greater dividends than a barrage of routine laboratory studies and X-rays.

Examination Advantages

From a critical analysis of the value and limitations of the periodic health examination we can list the advantages of such a program as follows:

1. Early discovery of silent and incipient disease conditions.

2. Improved health of those with chronic conditions.

3. A doctor-patient relationship is established as the basis of health education. This leads to early detection of subsequent disease processes.

4. Development of a health record for future evaluation and comparison.

A review of these health records has led to the accumulation of medical facts which serve as a yardstick to measure the value of such a periodic examination program. The medical statistics speak for themselves. The "savings" achieved in the 48% who were "cured" or "improved" cannot be expressed in dollars and cents. The value of the skills and experience of those whose ability to do a productive job was maintained despite the presence of chronic disease is con-

(*Continued on page* 43)

range-taking

TRANSFORMER GROUNDING CONNECTOR type EQC

fits all standard EEI-NEMA distribution transformers . . . no stress corrosion cracking

here are features your line crew will appreciate:

- easy one-wrench installation
- wide range . . . from 8 sol. to #2 str. copper
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For other grounding problems . . . write for Burndy Grounding Catalog G 47

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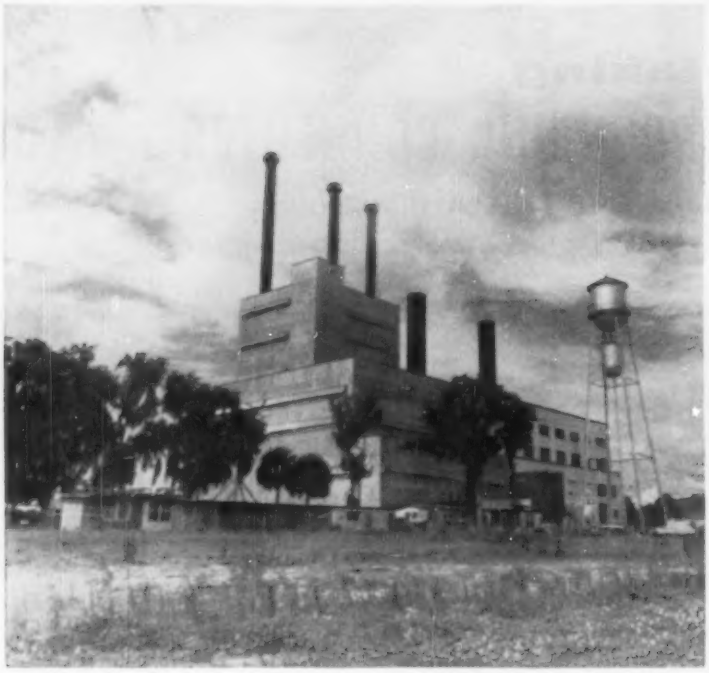


Florida Power Adds 70,000-kw Unit

A 70,000-kw generating unit has been added to Florida Power Corp's George E. Turner Plant bringing total capability of the plant to 111,000 kw. The new addition is shown at right above.

The company's Turner plant is located at Enterprise, Fla. Another 70,000-kw addition is under construction at Florida Power's Suwannee River plant in the northern part of the state. And a 120,000-kw plant is being planned for the St. Petersburg area.

Beaver Marsh Uncontested

Eugene, Ore., Water & Electric Board's Beaver Marsh hydro development for the upper McKenzie River won Federal Power Commission licensing without protests expected from conservation groups.

FPC, in issuing the license, announced that estimated cost of the 30,000-kw powerhouse and other structures was $8,538,000, about $1-million above EW&EB's estimate.

"Since no timely exceptions were filed or review initiated by the Commission, the decision became effective Nov. 21" in the 30-day period after FPC Examiner Francis L. Hall had issued a favorable recommendation, FPC's notice said.

Conservation groups, particularly the local Save-the-McKenzie Association of fishing guides and resort and motel operators had indicated at the time Hall announced his decision that the Association might oppose. Interior Secretary Douglas McKay was known to be personally opposed because of scenic and sports fishing aspects of the upper river inside the Willamette National Forest.

EW&EB's plan calls for a 34-ft high dam across the foot of Fish Lake, 1,600 acre ft of usable water, and a low diversion dam at Clear Lake to store 1,200 acre ft to channel water into an underground tunnel which will utilize 400-ft of head to drop to the two unit powerhouse at Beaver Marsh where a re-regulating dam will be erected.

Cost estimates of FPC varied from those of the Oregon municipal system. The Eugene board had estimated total cost at $7.8 million. But Hall had noted in his decision the higher FPC staff figure still was within the economic feasibility range.

PG&E's City Pact

New 7-year contract signed to supply nine California cities with power; rate hike included

Nine northern California cities have signed a seven-year contract for wholesale power with Pacific Gas & Electric Co, thus spacing out over a three-year period a rate increase authorized in 1952 by the State Public Utilities Commission.

The nine cities—Alameda, Biggs, Gridley, Healdsburg, Lodi, Lompoc, Palo Alto, Santa Clara, and Ukiah—will pay the increases in four steps, the first effective with the expiration of their individual contracts. Rate increases averaged about 27%.

Long-term Pacts Delayed Hikes

Enforcement of the increases was delayed in the case of these cities because they were operating under previous long-term contracts. Last summer, as their former contracts neared expiration, they approached PG&E in the hope of further delaying the increase with another long-term contract.

The group originally included another city, Roseville, but its city council voted against the contract since its members felt that cheaper public power might become available early in the contract period from the newly launched Trinity River project or from that planned for Feather River.

When Roseville dropped out, negotiations collapsed since they had been carried on under an "all or none" basis. However, further talks resulted in PG&E's agreement to sign with the nine-city group.

Savings reportedly ranging from $2,100 to $222,000 will be made by the participating cities in the first year of contract. Roseville will pay higher rates on a month-to-month basis.

Ohio Power Expanding

Ohio Power Co is planning construction of a 1,000,000-kw, $125-million steam plant on a 500-acre site on Ohio River north of Clarington, Ohio. The American Gas & Electric Co subsidiary selected the site because of proximity to abundant and economical coal reserves, and the area's expanding industrial growth.

a slow speed meter will live longer too!

In these fast-moving times, it's almost standard practice for doctors to warn busy executives to slacken their pace. Perhaps your doctor has advised you to slow down. If he did you probably took his advice because, well—we all want to live longer.

* * *

Slow-speed watthour meters will live longer too—because slow-speed means less wear on moving parts. This is why the Sangamo J2 Watthour Meter with its 6. constant will last longer than an ordinary meter with a 3.6 constant. The J2 is *the* slow-speed meter. There's less wear on all moving parts.

How much slower is the J2 than other meters? A full 40% slower. The J2 makes 111.1 *fewer* revolutions to measure 1 kilowatt hour.

THE FIRST WATTHOUR METER WITH STRAIGHT LINE ACCURACY UP TO 100 AMPERES

SANGAMO
ELECTRIC COMPANY
SPRINGFIELD, ILLINOIS

JM55-5

Get More for Your

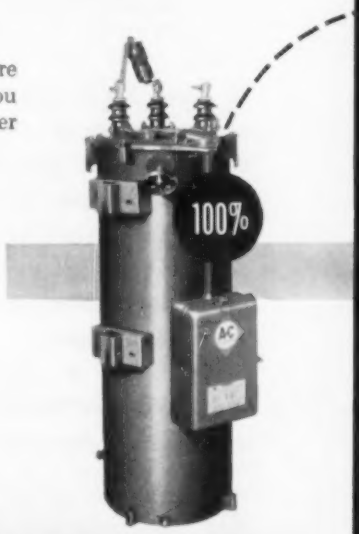
Vari-Amp Feature Gives You 5 Ratings in 1

No Need to Change Regulators as Loads Grow when Allis-Chalmers distribution regulators are on your system. The *Vari-Amp* feature lets you step up ratings as much as 60% by reducing the range of regulation.

Here's how it's done: Reduce the range of regulation on a step-type regulator and you can increase current-carrying capacity. The *Vari-Amp* feature provides stops that limit range of regulation in five 1¼% steps from ±10% to ±5%.

Fits Varying Requirements

You get considerable flexibility because the *Vari-Amp* feature permits using unequal ranges of regulation. Set what you need — for example, 6¼% raise at 135% current, 10% lower at 100% current.



No Extra Cost

Best of all, you get this convenient feature on Allis-Chalmers distribution regulators at no increase in cost. You get more uses for each regulator.

Get complete information on how the *Vari-Amp* feature can help you stretch your regulation dollar. Call your nearby A-C office or write Allis-Chalmers, Power Equipment Division, Milwaukee 1, Wisconsin. A-4811

Originators of 5/8% Step Regulation

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Regulation Dollar

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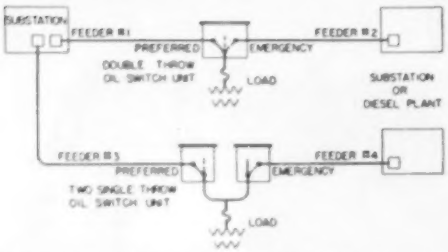
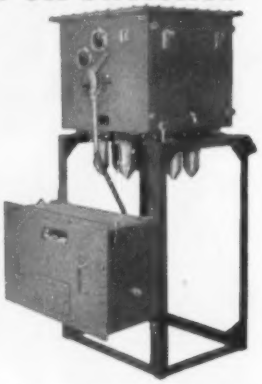
INSURE SERVICE CONTINUITY

with G&W Automatic transfer oil switches

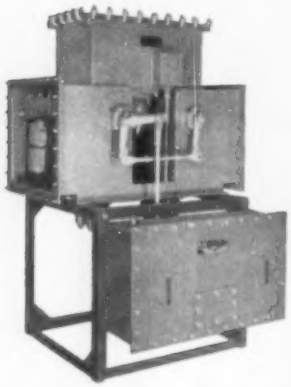


- When preferred feeder voltage fails, the load is automatically transferred to the emergency feeder.
- When preferred feeder voltage is restored (for a period of ¾ minute) the load is automatically returned to the preferred feeder.
- There is no "hunting" on system disturbances. Load cannot be thrown to a "dead" source.
- Model "F6" automatic mechanism provides for remote operator selection of either feeder as the "preferred."

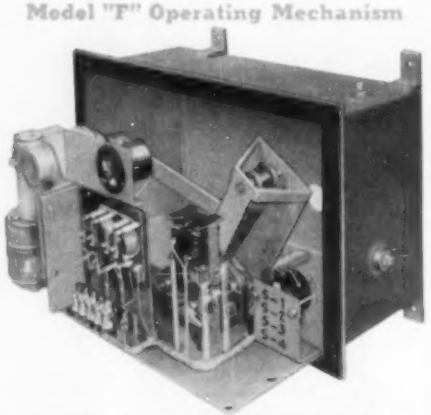


Type "RAD" double throw oil switch unit with Model "F" automatic mechanism.

Model "F" Operating Mechanism



TYPE "DRA" two single throw oil switch unit with Model "F" automatic mechanism. Air filled isolating link box on top.



Improved mechanism removable from watertight case. Motor compresses spring which, when released through action of relays and solenoid, operates the oil switch.

The automatic mechanisms are applied to various forms of Type "RA" oil switches, either for underground cables or overhead connections—up to 23 Kv., 400 amperes. All control wiring is done at the factory. Installation of the unit merely involves connection of the feed and load cables or wires.

Send for Bulletin DA-F which fully describes Model "F" mechanism.

G&W ELECTRIC SPECIALTY CO.

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Representatives in principal cities of U.S.A.

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D-555

1905

50th ANNIVERSARY

1955

ASME Hears Report on Atom

Impressions of participants at Geneva Atoms for Peace Conference and panel discussion of supercritical pressure units are topics at the annual meeting

Engineers who attended the American Society of Mechanical Engineers' Diamond Jubilee Annual Meeting (Chicago, Nov. 13-18) received a complete report of the recent Geneva Atoms for Peace Conference. They heard that U.S. scientists and engineers benefited from the exchange of information with their Russian counterparts.

In addition they heard that:

1. The once-through boiler can not be justified at 1,800 psi but is required above 2,400 psi.

2. The efficiencies gained by lowering stack gas temperatures to 200F can offset the corrosion problems occurring at this lower exit temperature.

3. Ultrasonic testing of forgings will greatly reduce the probability of the recent rotor failures.

4. Centralize maintenance forces help keep production costs down.

Experts Present Views

Reporting on their observations at the Geneva Conference were W. H. Zinn, director, Argonne National Laboratory, Lemont, Ill.; A. M. Weinberg, research director, Oak Ridge National Laboratory; H. A. Wagner, assistant manager of engineering, Detroit Edison Co; Philip Sporn, president, American Gas & Electric Service Corp; and B. R. Prentice, manager, nuclear systems design study, Atomic Power Equipment Department, General Electric Co.

Russians Good in Physics

Dr Zinn reported that the things we learned from the Russians in the order of their importance were their Reactor physics and physics, mechanical design of reactors, technology of uranium, fuel element design, fuel element fabrication, and fuel element burnout.

The Russians, said Dr Zinn, use uranium in the form of an annular ring as their fuel. Stainless steel is used for tube construction. Their design leads to a conversion ratio much lower than American designs, and this, it is felt, is one of the keys to economic use of atomic power. The Russians use many coolant tubes and many pumps. For each pump required, they have two or more placed in reserve. Unloading is slow. Two to three days are required to change fuel elements. Their control room is very elaborate. Their power reactor produces 30,000 kw of heat and 5,000 kw of electricity, which is considered good. Reactor water pressure is 1,500 psi, steam pressure 150 psi.

Dr Weinberg discussed the fundamentals that go into the different reactor types and said that he could list 100 different reactor types which are possible. The big question, he said, is which is the most likely to succeed.

There are two basic questions on choice of reactor type. The first is the fuel type to be used, whether it be natural uranium, slightly enriched uranium, or highly enriched uranium. The other question is that of conditions in the area, both with regard to fossil fuel supply and nuclear fuel supply.

Russia and the U. S. have an ample supply of fossil fuels and, therefore, do not need to depend on nuclear energy. England's fuel crisis dictates a simple, reliable reactor and justifies their use of low enriched uranium.

Atomic energy offers hope for economic power for countries without fuels today but the investment required is very high, Wagner said.

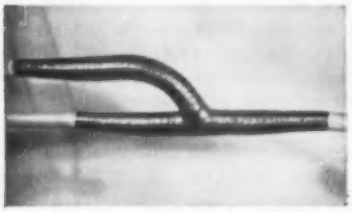
Sporn said that it was apparent at Geneva that the U. S. was in the lead in nuclear power developments, with the United Kingdom second, and Russia third. This, he said, is subject to change but he does not think it will change soon. Geneva gave spectacular evidence of how eager nations are for nuclear power, he said, but they will be dissappointed if they expect a fast change in economy. He said the conference showed that we still have a long way to go in establishing nuclear power.

Prentice reported several reactions

RUSSIAN OBSERVERS, V. P. Loukine, left, and G. P. Kazanski, right, added international flavor. In center is their American escort, Brig Gen Stewart Reimel

UNUSUAL BRANCH CONNECTOR Saves Manhole Wall Space

With all the remarkable synthetic fibers appearing on the market, a lot of new plants are going up to manufacture them. One of the biggest plants ordered 28,000 feet of Okolite-Okoprene cable for its underground primary distribution system.



One of the interesting features of this big installation was their method of saving manhole wall space—an important consideration in all underground work. Since the cable was about 2" in diameter, it would have required around 24" space for training the tap, if a regular Tee joint was used.

Instead Okonite engineers worked out a preformed branch connector, in cooperation with a fitting manufacturer. From the picture you can see that by forming the connector instead of bending the cable the radius of bend was cut in half. Q.E.D.: only half as much manhole wall space was required.

Engineers at this plant weren't taking any chances with their cables . . . and they weren't taking any chances with their splices either. They made all their splices with Okolite, Manson and Okoprene tape.

It's good sense and good business to use a better tape and obtain a joint that's "spliced for life." The tape represents only a small fraction of the total cost of the job.

Why not send for a set of instruction sheets, EW-5678; you'll find them helpful.

. . . when you splice with:

AVAILABLE THROUGH AUTHORIZED DISTRIBUTORS ONLY

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Made by
THE OKONITE COMPANY
PASSAIC NEW JERSEY
SINCE 1878

SPECIALISTS IN ELECTRICAL WIRES, CABLES AND SPLICING MATERIALS FOR 75 YEARS

to Geneva. The first was the difference in the programs in the different countries as related to environments. There are good reasons for these differences, he pointed out. The military requirements and the present cost of power in the area are important. The difference in the number of qualified people available determines how many possibilities can be pursued at the same time. The U. S. is using enriched uranium because with low cost power available we have to shoot at higher performance. The Russians do not recognize the economic importance of the conversion ratio, of using up the greatest percentage of the atomic fuel, Prentice declared.

Philo Plant Discussed

In the session on the first supercritical pressure steam-electric generating unit at American Gas & Electric Co's Philo Plant, S. N. Fiala, AG&E's chief engineer, said that 4,500 psi was chosen because that was the optimum pressure for 1,150F. This unit was developed with a view to larger and more efficient units of these pressures and temperatures in the future. The size, 125 Mw, was selected because it fitted into the existing plant. Interesting features include: The very high degree of purity required for boiler feedwater and the method of cooling many parts of the turbine. This is done by steam tapped from the 4,500-psi main and desuperheated.

Once-through Type Boiler

W. H. Rowand, vice president, Babcock & Wilcox Co, said that there is no boiling in the supercritical pressure steam generator. It is a once-through type, and steam and water are not together in the tube. In the unit 85% of the heat absorbed is for superheat and reheat as compared with 45% for these purposes in the conventional steam generator.

The supercritical steam generator, Rowand said, replaces four boiler units installed in 1923. The old boilers served a 40,000-kw turbine-generator and the heat rate was 14,000 Btu/kwhr. The new unit, serving the new 125-Mw turbine-generator, will have a heat rate of 8,500 Btu/kwhr.

Regarding economies of the once-through boiler, Rowand said it cannot be justified at 1,800 psi. At 2,400 psi consideration must be given to each case. Above 2,400 psi the once through design is required.

AT MAINTENANCE SESSION were G. V. Williamson, left, Union Electric Co; J. R. Michel, Commonwealth Edison Co; and V. F. Estcourt, Pacific Gas & Electric Co

In describing the supercritical steam turbine at Philo, C. W. Elston, General Electric, said that the relatively low allowable stresses of ferritic steels above 1,050F compelled the use of austinitic steels in the turbine unit. Wall thickness of the austinitic parts were made as small as possible.

Spindle failures on large turbine-generators was the subject of one session of the Metals Engineering group. A. W. Rankin and B. R. Seguin, General Electric, reported on the investigation of the turbine wheel fracture at the Tanners Creek Plant. H. D. Emmert, Allis-Chalmers Manufacturing Co, described the investigation and findings on the spindle failure at the Ridgeland Station. Carl Schabtach, General Electric, reported on investigations of two generator rotor failures, one unit being built for service in Arizona and on test at Schenectady, N. Y., the other unit in service at the Cromby Station of Philadelphia Electric Co.

The investigations indicated that the failures originated in flaws in the forgings used for these spindles. The flaws had escaped detection by the available methods of inspection, but the conclusions were that developments in ultrasonic testing in the last few years should give better inspection results in the future and greatly reduce the probability of such failures.

Plant maintenance costs constitute a large part of production costs, and design and management must be coordinated if maintenance is to be kept to a minimum, said V. F. Estcourt, Pacific Gas & Electric Co. A big part of maintenance costs lies in availability of machines and the cost of replacement power when a machine is out for maintenance.

Development of a full cost accounting system beyond that covered by FPC accounts and the use of machine accounting aimed at correcting faults, have helped Union Electric Co of Missouri reduce it's maintenance costs, said Vice President G. V. Williamson.

Centralized Maintenance Used

Maintenance cost is 50% of production costs, said C. W. Watson, Philadelphia Electric Co. The Philadelphia utility uses a centralized maintenance force, said Watson, which helps keep costs down.

Design details of the new nuclear power station of Commonwealth Edison Co are no yet available said T. G. LeClair, the company's engineering assistant to the vice president. The station will have a capacity of 180,000 kw, will be located west of the confluence of the Kankakee and Des Plaines rivers, near the Dresden locks and will be known as the Dresden plant. It will generate at a cost somewhat higher than the cost of power from coal fired plants in the higher fuel cost areas of the U. S. The reactor will be a dual-cycle, boiling water type. Design details are now being developed. The tentative operating date for this plant is some time in the latter part of 1960.

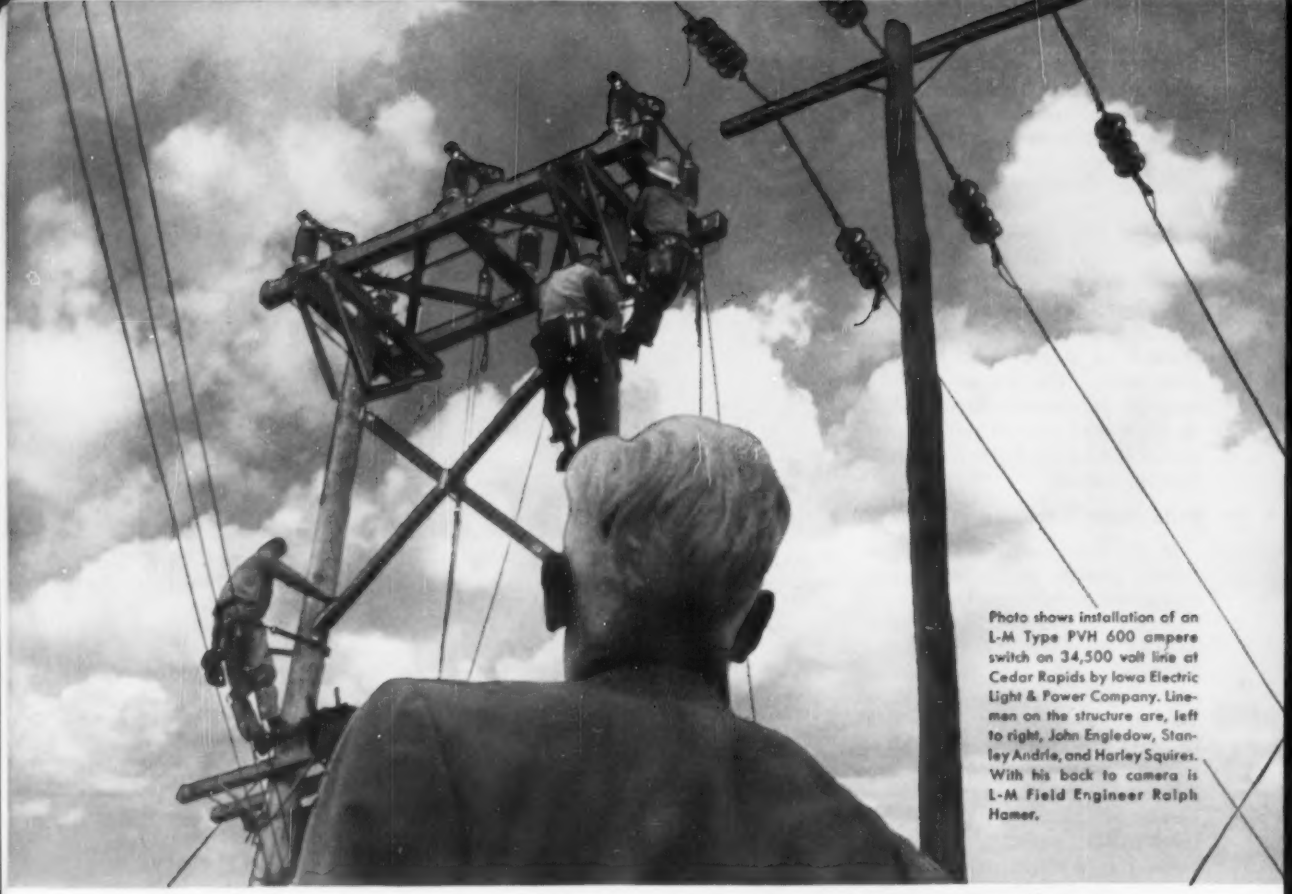


Photo shows installation of an L-M Type PVH 600 ampere switch on 34,500 volt line at Cedar Rapids by Iowa Electric Light & Power Company. Linemen on the structure are, left to right, John Engledow, Stanley Andrle, and Harley Squires. With his back to camera is L-M Field Engineer Ralph Hamer.

Iowa EL&P Installs L-M PVH Switches To Cut Sparkovers on Lightning Surges

by
HOWARD K. HOLLINGSHEAD
District Operating Mgr.
Iowa Electric Light
& Power Company

The photograph shows the installation of an L-M type PVH air break switch on our lines at Cedar Rapids. The new switch replaced an older switch on a point in the lines that is operated "normally open."

The former switch operated satisfactorily as a normally closed switch, but on normally open service the inadequate clearance caused line tripouts and switch insulator damage caused by lightning surges during thunderstorms. During the summer of 1954, eight of the nine insulators on the old switch were damaged.

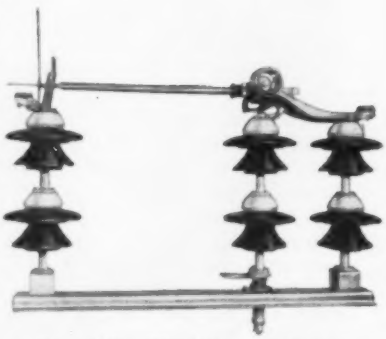
We expect that the new PVH switch has ample clearance and thus will eliminate the trouble. As additional assurance against surges piling up and spilling over, arresters have been installed on each side of the switch one span away.

Since it was not practicable to de-energize the circuits joined at this point during installation time, they were dead-ended temporarily on the single pole shown at the right of the photograph, while the switch is being installed on existing poles.

The new L-M switch is being installed under the supervision of Crew Foreman Howard Norris. He and all the members of the crew were particularly pleased by the rugged simplicity of the PVH switch and the ease of assembly and adjustment. He particularly liked the identification of the interphase bars and the foolproof method of installing them.

Get This Bulletin For Complete Information

L-M offers a complete line of vertical air break and hook switches through 1200 amperes and 69 kv. For information and bulletin ask the L-M Field Engineer; or write Line Material Company, Milwaukee 1, Wisconsin (a McGraw Electric Company Division).



L-M type PVH switches offer ample clearances; castings of aluminum bronze alloy which make them exceptionally strong and light; and the design provides a powerful lever advantage to assure positive operation regardless of ice, corrosion, or long periods of non-operation.

240

LINE MATERIAL
Power Switching Equipment

L-M's new 50 kvar, 2400 volt capacitors, ready for shipment. L-M now offers a line of more compact factory-assembled pole-mounted racks in all voltage ratings from 2400 to 7960/13,800 volts, multi-grounded Y.

OFF THE PRODUCTION LINE...

You, too, can enjoy the benefits of L-M's **New 50 kvar** Capacitors NOW

Shipments have started on Line Material's new 50 kvar Elemex Capacitor. The unit is an outstanding achievement in capacitor engineering and production. It has the same width, same thickness as a 25 kvar capacitor. Only ten inches of additional height give you twice the capacity.

Per kvar, L-M's new 50 kvar capacitor is lighter, requires less pole space, and takes less installation time. Thus, installed cost per kvar is lower. It meets applicable NEMA standards for 25 kvar capacitors.

Ask the L-M Field Engineer for information on features, design and delivery of the new 50 kvar capacitor and capacitor equipments. Or write Line Material Co., Milwaukee 1, Wis. (a McGraw Electric Company Division).

LINE MATERIAL

LM

Elemex® Capacitors

Hydraulic dredge pumps fly ash away from plants in . . .

one of two pipe lines . . .

Dredge Pumps Ashes to Storage Area

GENERATION
Design

Alabama Power Co installed the dredge as the most economical and flexible means of delivering fly ash to distant storage area

F. B. WINGATE, Senior Engineer, Materials & Contracts, Major Project Construction, Alabama Power Co, Birmingham, Ala.

A hydraulic dredge is pumping 4,725 tons of fly ash and bottom ash a week from the Gorgas Plant through a pipe line to a storage area nearly 0.7 mile away. Use of the dredge is the cheapest way for Alabama Power Co to move ashes to a storage area with a 20-year capacity. Moreover, the dredge operates in a lake which provides three-month surge capacity in event the pump or pipe line breaks down.

Gorgas Plant in Walker County, Ala., is actually two plants, and a third is under construction. Plant No. 1 has a 70-Mw capacity but does not operate enough to affect the principal ash-disposal problem. Plant No. 2 is a more modern four-unit plant of 320-Mw capacity, all of whose boilers are fired by pulverized coal. Initially, Plant No. 3 will consist of one pulverized coal-fired, 150-Mw unit for 1956 operation. A 165-Mw will follow for 1958 operation.

Dispose of Week's Ashes

The problem was to dispose of all ashes, and it was considered desirable to dispose of a week's ashes in one single 40-hr shift.

Gorgas is in a valley at the confluence of Bakers Creek and the Warrior River. No land near the plants was suitable for economical ash storage. A study led to the company's decision to utilize a natural hollow, known as Rattlesnake Slough, across the Warrior River several thousand feet from Plant No. 2.

Alabama Power obtained a permit from the Army Corps of Engineers for a pipe crossing under the Warrior River. A pervious, rock-filled dam was then constructed across the slough approximately 1,600 ft from the river, the height of the dam was set to afford a 20-year storage volume.

Pumping Means Studied

Southern Services, Inc, an affiliate, and the production, and engineering and construction departments of Alabama Power investigated several methods of pumping ashes to Rattlesnake Slough. These included:

1. A booster station with different variations.
2. A fixed pumping station on the edge of the old filled ash storage lake close to Plant No. 2.
3. A hydraulic dredge on the old ash lake close to Plant No. 2.

The hydraulic dredge was selected for several reasons besides economy, but principally because the availability of a small ash-disposal lake at the plants for dredge operation provided a three-months' surge storage for emergencies. If the pipe line clogs or pumping machinery breaks down, the plants will not be shut down. Disposal pumps in the plant under normal operating procedure will pump ashes to the surge storage lake.

Hydraulic Dredge Chosen

The dredge selected, costing about $100,000, is a relatively large piece of equipment for the 4.5-acre lake. Overall dimensions of the hull are 58x22x5 ft. The basket-type cutter head is 36 in. in diam on a 35-ft ladder and is capable of dredging to a depth of 25 ft.

Except the cutter motor, all machinery is completely enclosed in a prefabricated metal deck house. All controls are air operated from an elevated control section with 360-deg visibility. Not equipped with spuds, the dredge is maneuvered by four winch lines running to shore anchors. The main dredge pump is a 12-in., single-stage pump with a 37-in. impeller. This is powered by a 700-hp, 720-rpm, 2,300-v motor.

Ashes are pumped from the dredge to the shore connection through a single 12-in. steel-alloy pipe line supported by pontoons. The 2,300-v power supply and the telephone line to the dredge are brought out along the same pontoons.

Ash is discharged from the pipe . . .

behind a rock-filled dam across a slough

The length and importance of the shore pipe line from the dredge shore connection, across the intake canal, and under the river were sufficient reasons for studying this line. From this study came the decision to lay two complete pipe lines from the dredge shore connection to Rattlesnake Slough, one to serve as a spare.

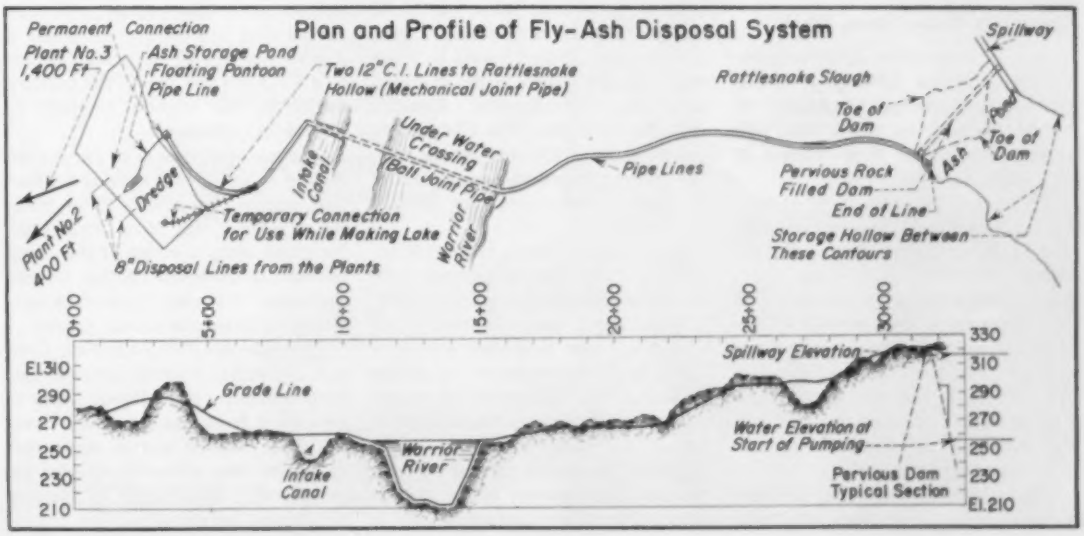
The two lines follow the terrain with a minimum of grading, thus avoiding a high hill and a long underwater river crossing. Concrete and timbers were used as supports, and concrete anchors were installed at all pipe bends.

Alabama Power's practice is to use a heavy wall, cast-iron pipe for ash-disposal lines. The pipe selected for this installation was 12-in. diam, ¾-in. thick, cast iron with less than 1% chrome added. Pipe bends were cast with an extra thickness of material on the outside wall to compensate for possible excessive wear. The addition of chrome is expected to increase greatly the life of the pipe.

Surge Pond Excavated

Operations began with the excavation of a 100-ft square hole in which to assemble the dredge. A temporary shore discharge line was laid to this assembly point. The assembled dredge was then put to work making the small lake where it would continue to operate, pumping the old ashes in the lake to Rattlesnake Slough. As soon as practicable the temporary connection was removed, and the dredge was piped to the permanent connection, as shown in the plan. In normal operation the dredge will swing in an arc in front of the three 8-in. disposal lines from the plants. Three spare ash disposal lines were also laid between the plants and surge pond.

Reports on the operation of the dredge since July 1955 indicate that this ash-disposal method will be entirely satisfactory. Total length of the discharge pipe is approximately 3,650 ft, and discharge pressure at the pump approximately 110 to 120 psi. Velocity of material pumped through the pipe is approximately 17 fps (5,500 to 6,000 gpm), which is considerably faster than the company's standard in handling ashes. This velocity should be maintained because of the river crossing but may depend on pipe wear.



FUTURE FARMERS OF AMERICA DEMONSTRATE THEIR KNOWLEDGE OF ELECTRICAL APPLICATIONS TO FARM CHORES

Sell Youth On Electrical Farming

SALES
Rural

Pennsylvania Power, through contests to show what electricity can do on the farm, helps make farming more attractive to youth

WALTER E. GROSS, General Farm Sales Supervisor, Pennsylvania Power Co, New Castle, Pa.

Electricity has successfully taken over a great number of farm jobs in recent years and has been an important influence in keeping farm boys on the farm.

Because food production, processing and distribution is by far our biggest single business, our nation can prosper only if agriculture progresses. Farming must be made sufficiently attractive to encourage farm youth to adopt this enterprise as a vocation, follow it agressively and profitably and thus protect this all-important basic industry.

Electricity Eases Farm Work

Because outstanding ability is essential to successful farming, it is important that intelligent influence be brought to bear on youth with high ability to stimulate their interest in choosing farming as a career.

To attract and retain those of such caliber demands that farming be made a desirable vocation. This calls for showing them how outmoded methods can be supplanted with practices that will eliminate a large amount of the time-consuming, animal-like toil and drudgery that has characterized farming for so long. It is necessary to show how electricity on the farm can provide all the comforts, conveniences and pleasures of city life.

Pennsylvania Power Co has had the privilege of cooperating with leaders of farm groups for a number of years by helping them with parts of their programs. Since 1948 they have co-sponsored annual demonstration contests for Future Farmers of America teams in Beaver, Butler, Lawrence, Mercer and Venango Counties.

The contest is based on the demonstration of any approved farm practice. Cash prizes are given to the top four teams and each team that participates is given a cash award. The prize fund is furnished by Penn Power and the other three electric companies serving the above five counties. Winners of the contest compete in the State Demonstration Contest held in conjunction with the State Farm Show in Harrisburg.

In the past three years, out of 30 possible awards at the State Show (first ten each year), 15 went to teams who had participated in the Midwestern Pennsylvania Contest. Although only 7½% of the FFA Chapters in the state are in this midwestern area, 34% of the teams that participate in the state contest are from western Pennsylvania.

Team demonstrations have wide appeal and tremendous educational value to participants and spectators alike.

In the seven years that the Demonstration Contests have been held, over 150 boys have participated. A special feature of the contest is the award, consisting of a trip to Cleveland and Nela Park, made to the team which conducts the largest number of preliminary presentations of its demonstration to public audiences. As a result, it is estimated that the demonstrations—effective promotions of approved farm practices—have been shown to over 35,000 adults, in addition to the competitive showings. In one year one competing team had 22 individual showings to different audiences.

New Awards Offered

The most recent addition to Pennsylvania Power's program is a new series of awards for farm youth which is being inaugurated this year. "The Reddy Kilowatt Award," as it is called, will be presented to any farm boy or girl who qualifies by featuring the use of electricity in the farm achievement project, which is a regular part of the vocational or 4-H program. Any boy or girl who is a member of either a Future Farmers of America Chapter or a 4-H Club and lives in the territory served by the electric company is eligible to participate.

The use of electricity in the project may be to save labor, increase production, improve the quality of the product, improve the farm wiring for increased safety and use, or the development of improved lighting for the farmstead. The electric use must contribute substantially to the project.

Through the Demonstration Contest, the Reddy Kilowatt Awards, and other activities, Penn Power hopes to encourage farm youth to make farming their vocation and to assure that as farmers they will make effective use of electrical applications to increase production and profits.

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INSURES EXTRA PROTECTION

• Heat treated, alloy steel driving stud resists mushrooming — can be used over and over. Couplings of rugged Silicon Bronze.
• Completely copper-covered machined point speeds driving. All rod sections are threaded on both ends for use as top, intermediate or bottom section.
Permanently Moist Soil
BLACKBURN Sectional COPPER BONDED GROUND RODS

Blackburn Sectional Rods Get Down Into The Permanently Moist Soil

Drive down to permanently moist soil that gives lower earth to rod resistance. Actual experience shows a few dollars invested in deep grounding has saved thousands of dollars in overhead burn-outs.

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- Driving studs and couplings interchangeable with all standard sectional ground rods.
- Available through Electrical Distributors.

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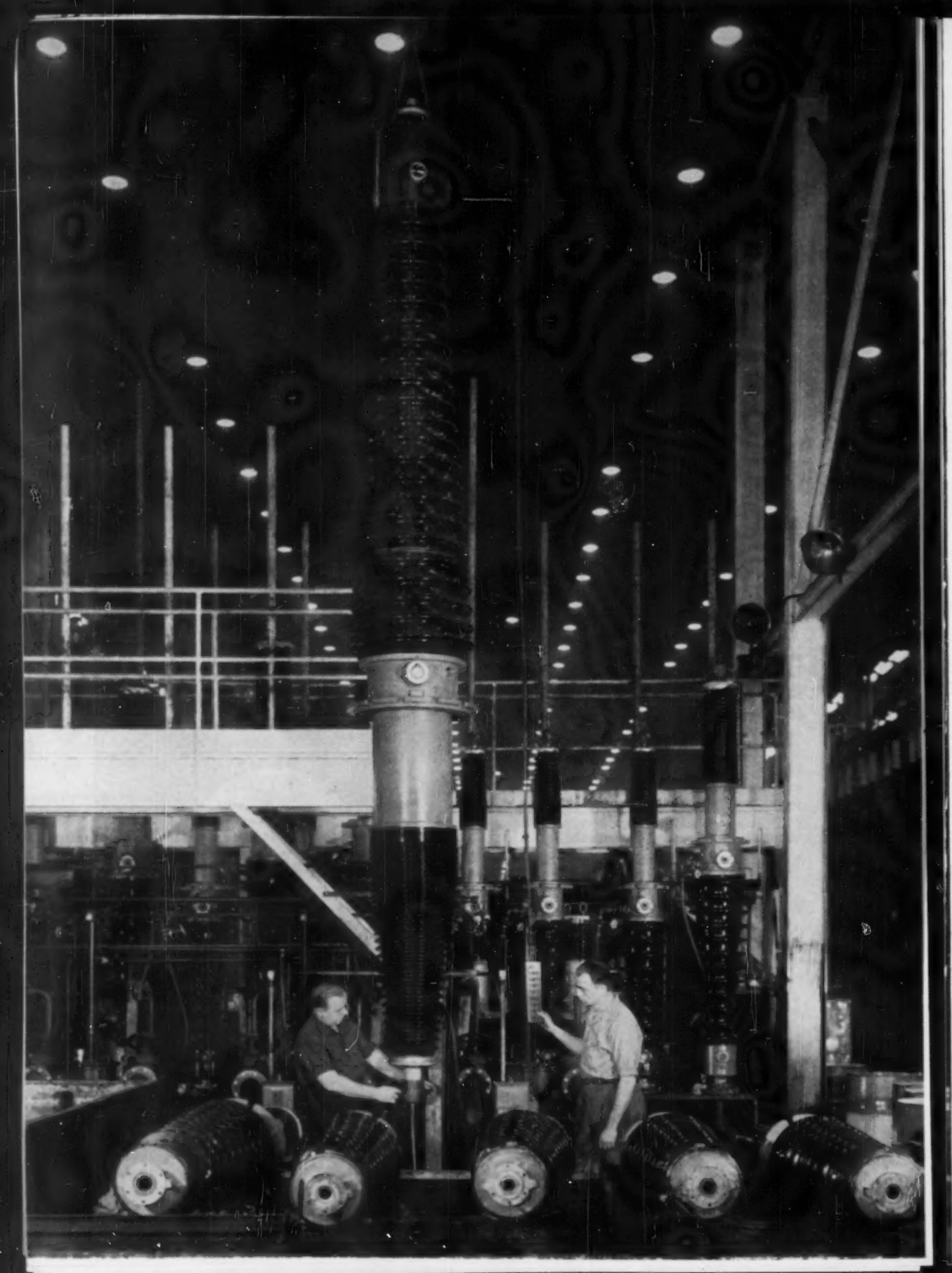


Helping the industry meet its growing loads

Better Service Continuity From 50 Years of Condenser Bushing Research and Development

Long ago, Westinghouse realized that bushings on your transformers and breakers must be one of the strongest links in your system.

Over 50 years ago they designed the first bushings using the *condenser* principle to provide a smooth voltage gradient throughout the insulation. Continuous improvements since then plus developments such as vacuum oil impregnation and high-strength, one-piece porcelain have resulted in today's trouble-free Type "O" bushing which only Westinghouse can offer you.

The dependability of these *Type "O" condenser* bushings which assures service continuity to your customers has been proved by 38,650 bushings in the field which have given service exceeding 180,000 bushing years since 1942.

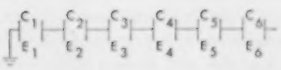
Another feature to provide both economy and ease of maintenance is the interchangeability of the Westinghouse bushings between transformers and breakers.

The same engineering leadership that developed this idea 50 years ago continues at Westinghouse today, searching out answers to your system problems . . . answers that, like the condenser bushing, will prove of greater and greater value to you as systems grow. *J-97192*

YOU CAN BE **SURE**...IF IT'S

Westinghouse

Type "O" Bushings . . . Trouble-Free Insulation



A series of equal capacity *condensers*, spaced concentrically around the conducting lead, provides uniform voltage stress not only throughout the insulation but also over the external surface. Oil impregnation under vacuum eliminates the possibility of voids in the insulation. This, together with the smooth *condenser* gradient, banishes internal corona with its resulting radio interference and insulation breakdown. The one-piece, high-strength porcelain is Westinghouse manufactured and engineered to coordinate with the bushing design.

At Ohio Valley Electric Company's Kyger Creek switchyard, these 330-kv, 25,000,000-kva circuit breakers are equipped with 330-kv Type "O" bushings as shown on the opposite page. For further details on Type "O" or Type "S" condenser bushings, call your Westinghouse sales engineer, or write Westinghouse Electric Corporation, P.O. Box 868, 3 Gateway Center, Pittsburgh 30, Pa.

E. C. SUMMERS

P. H. SOMMER

R. S. SOULE

Monongahela Appoints Executive VP, 2 VP's

Monongahela Power Co has promoted Vice President Eric C. Summers to executive vice president. And Paul H. Sommer and Robert S. Soule have been elected vice presidents of the utility.

Summers, who moves into the post left vacant by the retirement of C. H. Leatham last January, joined Monongahela as comptroller in 1951. He has served as vice president since May, 1953.

His career with West Penn Electric Co system, of which Monongahela is a part, began in 1924 when he went to work for Potomac Edison Co. In 1932 he became assistant to the president of that company, and in 1950 before joining Monongahela he worked on special assignments for West Penn Electric.

Sommer began his utility career 33 years ago as general superintendent of West Virginia Utilities Co. In 1926, after Monogahela had taken over the West Virginia company, Sommer served in Fairmont first as an engineer and then, for six years, as division commercial manager. Later, in 1933, he was made Morgantown Division manager. For the past 14 months the Monongahela Power's seven-division organization has been reporting directly to him.

Soule, a graduate of Ohio University, came to Monongahela in 1927 after three years of teaching in Parkersburg High School. He was made educational director in the company's Parkersburg Division and moved to Fairmont a year later with similar duties. In 1931 he became personnel director, a post he has held ever since. Soule is a member of the industrial relations committees of Edison Electric Institute and Ohio Electric Utilities Institute. He is also a member of the personnel and office management sections of the American Management Association.

Both of the new vice presidents will continue to supervise the phases of company operation with which they are presently concerned—Sommer as assistant to Executive Vice President Summers, and Soule as personnel director.

G. D. HYNES

General Cable Elects Hynes Executive VP

G. Dewey Hynes has been elected executive vice president of General Cable Corp. His resignation as vice president of Equitable Life Assurance Society of the United States becomes effective Jan 1.

Since 1954, Hynes has been a director of General Cable. At present he is also a director of the First National Bank of Montclair, N. J.

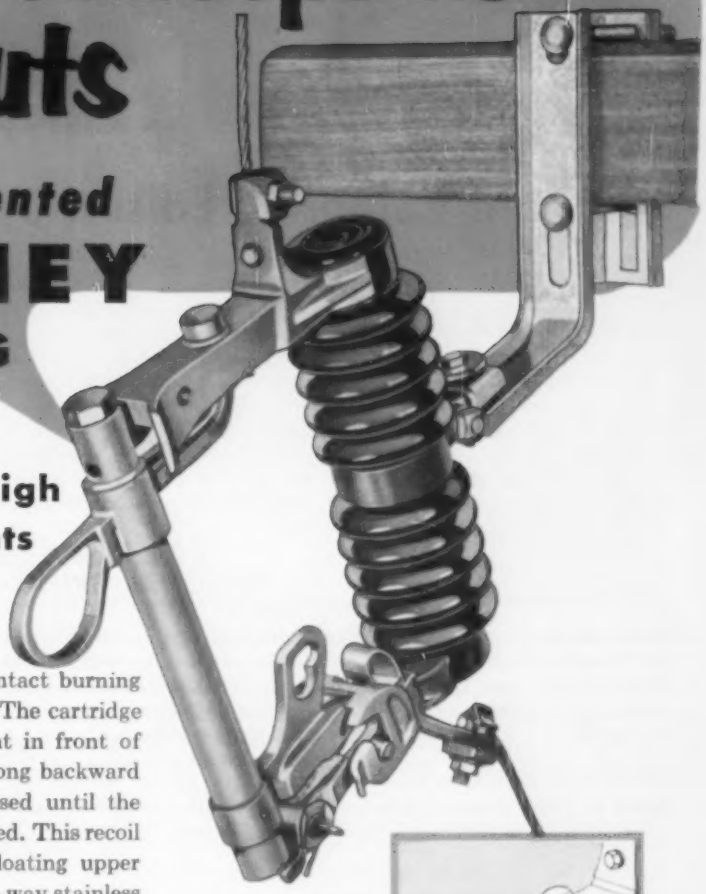
Hynes formerly served as vice president and director of Berkshire Life Insurance Co in Pittsfield, Mass., and vice president of First National Bank of Montclair.

Introducing . . .

A new concept in cutouts

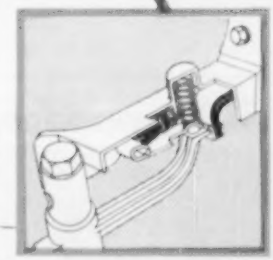
the *front-vented* KEARNEY TYPE G

Engineered to interrupt either high or low fault currents



With this new cutout design, KEARNEY has solved the problem of premature opening that causes contact burning on both high and low fault currents. The cartridge is double-vented with the upper vent in front of the tube. Gas expulsion creates a strong backward pressure . . . holding the contact closed until the current has been completely interrupted. This recoil is harmlessly absorbed by the full-floating upper contact which actually "floats" on two-way stainless steel springs.

In addition, the KEARNEY Type G Heavy Duty Cutout is designed with a new, high-strength, one-piece tubular insulator and new, rugged channel hanger. The upper contact is weather-protected and self-aligning. Standard button head fuse links are used.



-287

For Better Construction . . . Safer Maintenance

JAMES R. KEARNEY

Specify KEARNEY *The Mark of Quality* PRODUCTS

JAMES R. KEARNEY CORPORATION • 4234-42 CLAYTON AVENUE, ST. LOUIS 10, MISSOURI • Canadian Plant: GUELPH, ONTARIO

G. N. HAWLEY

J. H. MEAD

J. R. BROOKSHIRE

Southern California Edison Ups 3 Executives

Southern California Edison Co has announced new appointments for three of its executives—George N. Hawley, John H. Mead, and Joseph R. Brookshire.

Hawley, vice president in charge of commercial operations, has been named vice president and assistant to President Harold Quinton. Vice President Mead will take over direction of the company's commercial department, and Brookshire, former assistant to the president, has been named assistant vice president in charge of public and community relations.

Since joining Edison in 1928 as industrial heating specialist, Hawley has held numerous positions, including assistant new business manager, manager of industrial sales, sales manager, and assistant to the president. He was appointed vice president in 1952.

Mead, whose service with Edison began in 1922, has been commercial department special agent, and district manager in Pomona and Long Beach. He was named assistant vice president in 1950, and three years later was elected to a vice presidency.

Before his 1952 appointment as assistant to the president, Brookshire served as public relations assistant, and later as administrative assistant.

PERSONAL BRIEFS

Norman G. Lang, utilization engineer for Wisconsin Fuel & Light Co at Manitowoc, has been named general superintendent of the company's Wausau Division.

Westinghouse Electric Corp has named **Robert C. Cheek** manager of Industrial Heating Division's newly formed department in Baltimore for the manufacture of industrial electronics products . . . **Verne G. Rydberg** has been appointed manager of industrial tube sales for Westinghouse Electric Corp's Electronic Tube Division, and **Clifton Potter** has become manager of the newly organized commercial engineering department.

H. M. Harper Co has appointed **R. N. Hillner** as manager of standard product sales and **John A. Stevenson** as manager of technical sales . . . Minneapolis-Honeywell Regulator Co has promoted **James W. Hughes** to regional industrial sales manager for the midwest region with headquarters in Chicago.

H. P. Liversidge, Philadelphia Utility Board Chairman, Dies

Horace P. Liversidge, 77, chairman of the board of Philadelphia Electric Co since 1947, and former president from 1938 to 1947, died recently in Jefferson Hospital, Philadelphia, after a short illness. Associated with the utility and its predecessor, Edison Electric Light Co, for 57 years, he had also served as vice president and assistant chief engineer, general manager, and director.

Active in industry groups, he was recipient of the James H. McGraw Award, and Murrell Dobbins Pioneers of Industry Award. He served as a member of Edison Electric Institute's advisory committee, past president and member of Electrical Association of Philadelphia's board of governors, and former president of Association of Edison Illuminating Companies.

A graduate of Drexel Institute of Technology, he was elected board chairman of the institute last year, and also had been an officer of American Society of Mechanical Engineers, American Institute of Electrical Engineers, and Illuminating Engineers Society.

Research for New Savings in Power Plant Operation

Re:

METALS

HOW STRONG MUST METALS BE?

Obviously, if the science of steam generation is to continue to advance—as it must—the development of alloys is of fundamental importance. Before higher pressures and temperatures can be utilized, alloys must be found to withstand them and also offer greater resistance to corrosion and oxidation —all this within feasible economic limits. Somewhere between the costly "exotic" metals and plain carbon steel lie answers that will help pace the future progress of steam generation.

For example, at B&W's Research Center, development of greater strength in metals to withstand higher *pressures* and *temperatures* begins with the melt operation to protect essential high purity, and continues through batteries of exhaustive testing procedures. To better withstand *corrosion,* new alloys are being developed and tested for use in structural members such as superheater supports in oil-fired furnaces. In the particularly troublesome area of *welding dissimilar metals* (ferritic to austenitic) a newly developed alloy, still in the testing stage, is showing considerable promise. And work in welding techniques has recently helped develop a welding method that materially increases the rate of weld metal deposition with the submerged arc welding process.

Here, the work of research, development and testing never ends, for as progress is made new problems arise. How can costs be reduced further while achieving operating temperatures of 1200 F and higher? How soon will a satisfactory material be developed to withstand the corrosion common to oil-fired units? Can better alloys be developed to overcome the problem of radiation in nuclear power reactors?

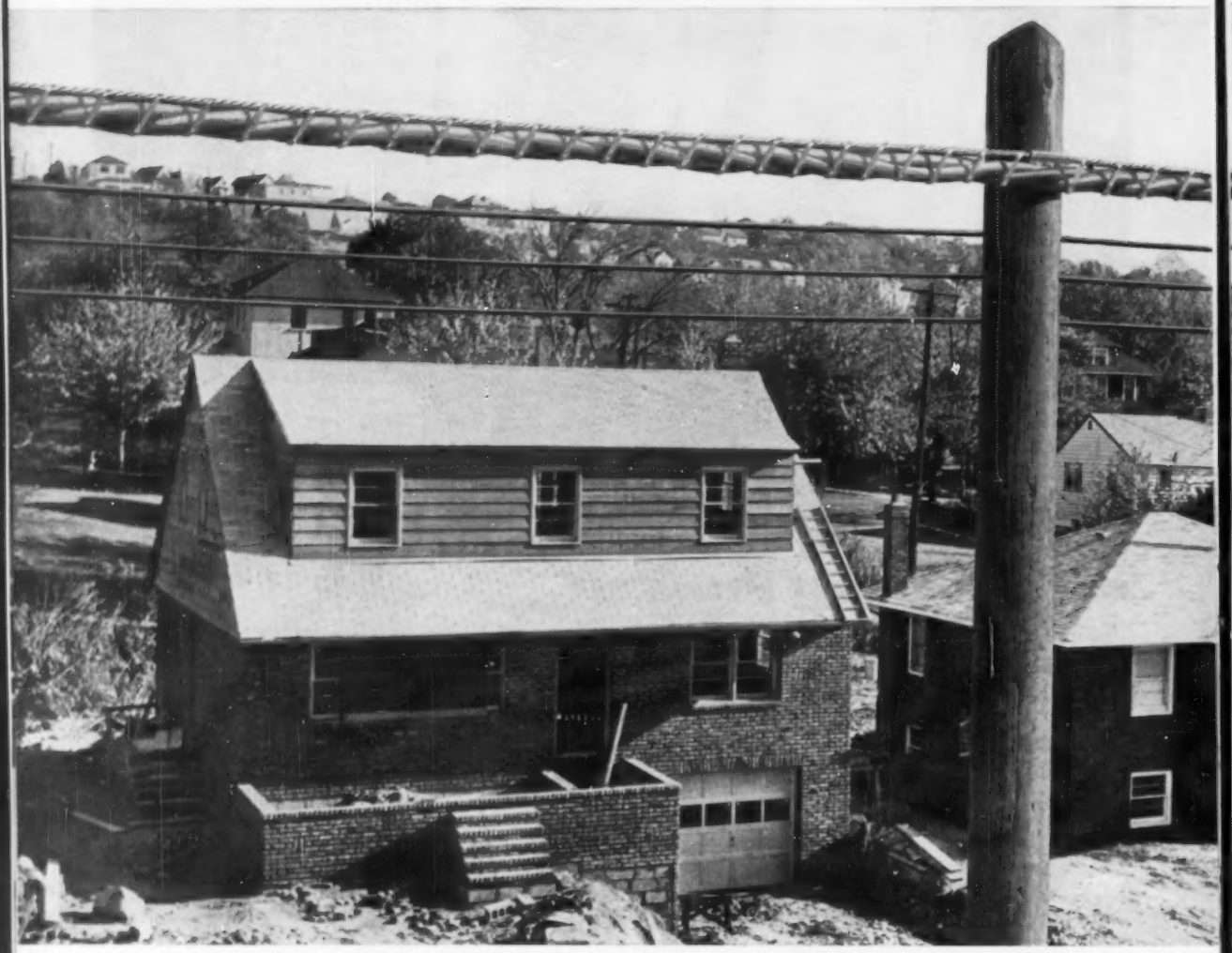
Specialists at B&W's Research Center continue to examine every facet of metallurgy affecting steam technology, governed always by the realities of steam generation economics. The intensity and continuity of these highly skilled efforts—concerned also with fuels, combustion, furnace design, heat transfer, fluid flow, water and steam purity, and nuclear energy—have already been responsible for acknowledged major advances. And as long as progress remains to be made, B&W will be dedicated to making it.

G-717

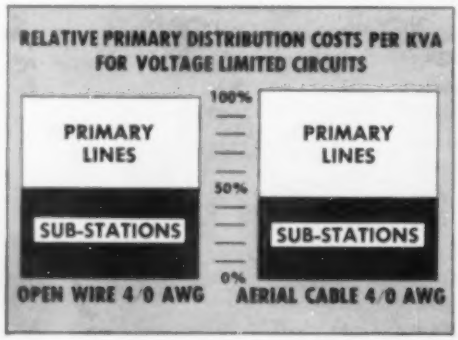
BABCOCK & WILCOX

BOILER DIVISION

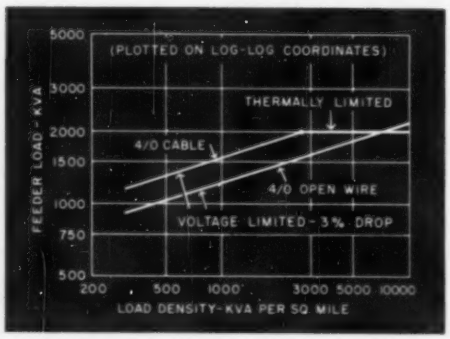
Get more load area coverage for



4/0 AERIAL CABLE vs 4/0 OPEN WIRE

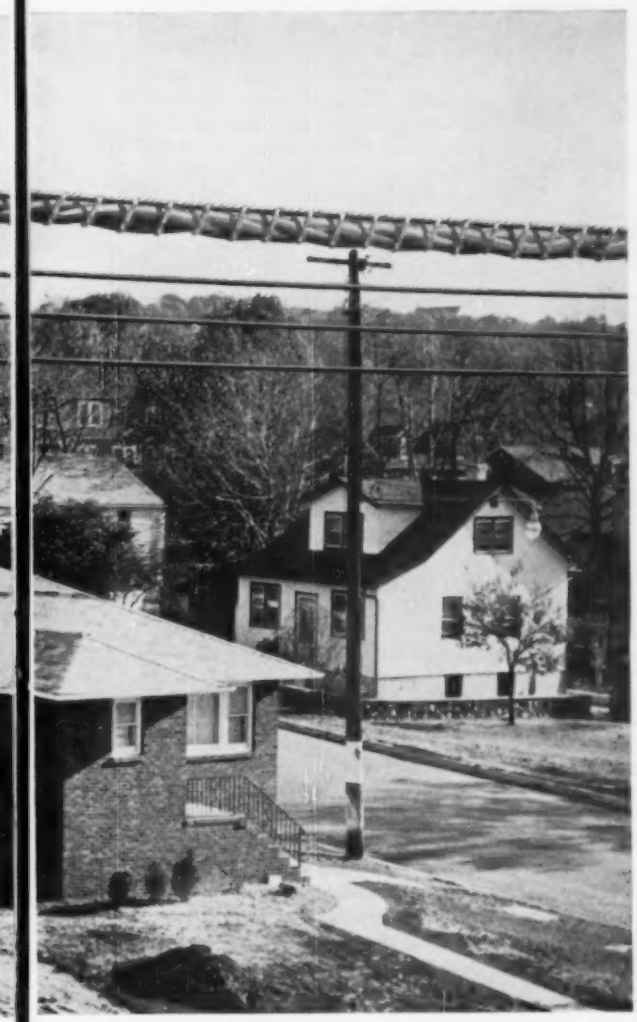


COST—Comparative primary distribution costs per kva for voltage limited circuits at 4160 volts.



FEEDER LOADING—Load density characteristics of 4160-volt feeders with 3% voltage drop limitation.

growing residential areas with G-E AERIAL CABLE



General Electric Super Coronol* aerial cable installations can help you meet increasing power demands in growing residential areas. Because of their lower reactance, these preassembled cables can carry far more load within a permissible voltage drop than open wires of the same conductor size. This means that larger areas can be covered than with open wire construction in voltage-limited distribution lines with these results:

1. Reduction in number of feeders required.
2. Use of larger substations.

Both of these advantages result in lower cost per kva of installed substation capacity.

The graphs at lower left show why the initial cost of an aerial cable installation, considered on a realistic basis of cost per kva of load (instead of cost per mile of line) is only 3 to 12% more than for open wire.

In addition, G-E aerial cable gives you:

BETTER APPEARANCE because crossarms, insulators, and unsightly open wire lines are eliminated.

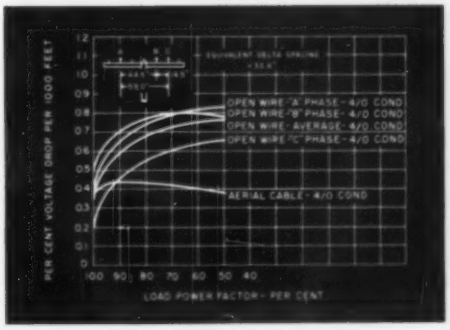
LOWER MAINTENANCE COSTS because there is less chance for storm damage, less need for tree trimming.

FEWER OUTAGE REVENUE LOSSES because messenger-supported cables are far less vulnerable to damage by weather and falling trees. Better service continuity improves customer relations.

INCREASED LOADS. Greater loads can be carried on voltage-limited 4160-volt feeders, up to a load density of 7500 kva per square mile, because of the combination of the low reactance and 85 C copper temperature of G-E Super Coronol preassembled aerial cable.

For additional facts send for a copy of "Economic Performance of Aerial Cable for Distribution Systems." Address Section W171-1227, Construction Materials Division, General Electric Company, Bridgeport 2, Connecticut.

*Registered Trade-mark General Electric Company.


PER CENT VOLTAGE DROP PER 1000 FEET
OPEN WIRE-"A" PHASE-4/0 COND
OPEN WIRE-"B" PHASE-4/0 COND
OPEN WIRE-AVERAGE-4/0 COND
OPEN WIRE-"C" PHASE-4/0 COND
AERIAL CABLE-4/0 COND
100 90 80 70 60 50 40
LOAD POWER FACTOR-PER CENT

VOLTAGE DROP—Voltage regulation per 1000 feet 4160-volt feeders, 1000 kva base, 3 phase.

Progress Is Our Most Important Product

GENERAL ELECTRIC

MEETINGS CALENDAR

An extended list of coming meetings appears in the last issue of each month

JANUARY 1956

WEED SOCIETY OF AMERICA—Charter Meeting, Hotel New Yorker, New York, Jan. 4-5; Northeastern Weed Control Conference, Annual Meeting, Hotel New Yorker, New York, Jan. 6.

* **EDISON ELECTRIC INSTITUTE**—Dealer Coordination Committee, Chicago, Ill., Jan. 15-17; Financing & Investor Relations Committee, Hotel Biltmore, New York, Jan. 19; Industrial Relations Committee, EEI Headquarters, New York, Jan. 19; Prime Movers Committee, Warwick Hotel, Philadelphia, Pa., Jan. 30-Feb. 1.

PERSONNEL TESTING LABORATORY—14th Personnel Testing Institute, Rensselaer Polytechnic Institute, Troy, N. Y., Jan. 16-20.

OKLAHOMA UTILITIES ASSOCIATION—Accounting Section, Alvin Hotel, Tulsa, Okla., Jan. 20.

AMERICAN SOCIETY HEATING & AIR CONDITIONING ENGINEERS—Annual Meeting, Cincinnati, Ohio, Jan. 23-25.

NATIONAL RURAL ELECTRIC COOPERATIVE—14th Annual Meeting, St. Louis, Mo., Jan. 23-26.

DOBLE ENGINEERING CO—23rd Annual Conference of Doble Clients, Sheraton Plaza Hotel, Boston, Massachusetts, January 23-27.

AMERICAN MANAGEMENT ASSOCIATION—General Management Conference, Fairmount Hotel, San Francisco, Calif., Jan. 24-27.

ELECTRICAL EQUIPMENT REPRESENTATIVES ASSOCIATION—Annual Meeting, Edgewater Beach Hotel, Chicago, Ill., Jan. 26-28.

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS—Winter General Meeting, Hotel Statler, New York, Jan. 30-Feb. 3.

FEBRUARY

EDISON ELECTRIC INSTITUTE—Conference Planning sponsored jointly with AGA, William Penn Hotel, Pittsburgh, Pa., Feb. 2-3; Transmission & Distribution Committee, Warwick Hotel, Philadelphia, Pa., Feb. 7-8; Electrical Equipment Committee, Homestead, Hot Springs, Va., Feb. 13-14; Commercial Lighting Committee, Hotel Shoreham, Washington, D. C., Feb. 15-16; Meter & Service Committee, Hotel Cleveland Cleveland, Ohio, Feb. 20-22.

GREAT LAKES POWER CLUB—LaSalle Hotel, Chicago, Ill., Feb. 2-3.

MISSOURI VALLEY ELECTRIC ASSOCIATION—Industrial & Commercial Sales Conference, President Hotel, Kansas City, Mo., Feb. 2-3.

INDUSTRIAL ELECTRIFICATION COUNCIL—National Industrial Electric Heating Conference, Netherland Plaza Hotel, Cincinnati, Ohio, Feb. 6-10.

PENNSYLVANIA ELECTRIC ASSOCIATION—Relay Committee, Benjamin Franklin Hotel, Philadelphia, Pa., Feb. 9-10; Electrical Equipment Committee, Penn Harris Hotel, Harrisburg, Pa., Feb. 9-10; Systems Operation Committee, Hotel Statler, New York, Feb. 16-17.

SOUTHEASTERN ELECTRIC EXCHANGE—Personnel Administration Section, Buena Vista Hotel, Biloxi, Miss., Feb. 9-10.

ROCHESTER ELECTRICAL EXPOSITION—War Memorial Building, Rochester, N. Y., Feb. 18-25.

NATIONAL ADEQUATE WIRING BUREAU—12th Annual Conference, LaSalle Hotel, Chicago, Ill., Feb. 23-24.

AMERICAN SOCIETY FOR TESTING MATERIALS—Committee Week, Hotel Statler, Buffalo, N. Y., Feb. 27-March 2.

MARCH

SOUTHEASTERN ELECTRIC EXCHANGE—23rd Annual Conference, Boca Raton, Fla., March 12-14.

NATIONAL ASSOCIATION OF CORROSION ENGINEERS—12th Annual Conference, Hotel Statler, New York, March 12-16.

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION—Edgewater Beach Hotel, Chicago, Ill., March 12-16.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS—Spring Meeting, Multonomah Hotel, Portland, Ore., March 18-21.

ILLINOIS INSTITUTE OF TECHNOLOGY—18th Annual American Power Conference, Hotel Sherman, Chicago, Ill., March 21-23.

OKLAHOMA UTILITIES ASSOCIATION—Annual Convention Biltmore Hotel, Oklahoma City, Okla., March 22-23.

PACIFIC COAST ELECTRICAL ASSOCIATION—Engineering & Operating Section, Palace Sheraton, San Francisco, Calif., March 22-23.

APRIL

ELECTRICAL MAINTENANCE ENGINEERS ASSOCIATION—8th National Biennial Electric Industry Show, Shrine Exposition Hall, Los Angeles, Calif., April 5-7.

SOUTHEASTERN ELECTRIC EXCHANGE—Engineering & Operation Section, Bon Air Hotel, Augusta, Ga., April 12-13.

EDISON ELECTRIC INSTITUTE—National Conference of Electric & Gas Utility Accountants, sponsored jointly with AGA, Hotel Commodore, New York, April 16-18; Accident Prevention Committee, Sheraton Hotel, St. Louis, April 30-May 2.

GREATER NEW YORK SAFETY COUNCIL—26th Annual Safety Convention & Exposition, Hotel Statler, New York City, April 16-20.

MISSOURI VALLEY ELECTRIC ASSOCIATION—Engineering Conference, Hotel President, Kansas City, Mo., April 18-20.

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS—2nd Conference on Recording & Controlling Instruments, Bradford Hotel, Boston, April 26-27.

* Additions to week.

Executive Health

(*Continued from page* 18)

siderable, although difficult to estimate.

The value to the executive himself lies in the fact that the periodic health examination will not only serve to maintain optimum health and peak efficiency during his active business life but it can also be the basis of good phsychological adjustment to the problems of daily life. In increasing his knowledge of his own abilities and limitations it can help him to deal effectively with his associates and those working under his jurisdiction. The value of this type of personal development in an executive training program needs no further comment.

The limitations of the periodic examination program are partly medical but more largeiy administrative in scope. The medical limitations have been shown to be mainly in the discovery of hidden heart disease and the detection of early malignancy. The time and cost factor has been the main obstacle from an administrative point of view.

POWER BRIEFS

• Soviet Union plans construction of a 3,000,000-kw hydroelectric station on the Angara River in Eastern Siberia. Intended to be the world's largest, the plant is designed to serve as the basis of industrialization of Eastern Siberia and as the main installation in a power network which will eventually include all of Siberia. Construction work will start next spring.

• Kansas Power & Light Co's new 33,000-kw turbo-generator at the Tecumseh station, recently placed in operation, completed the company's $2-million expansion project, and raised KP&L's total gross generating power to approximately 400,000 kw. With the addition, Tecumseh's generating capacity is 100,000 kw.

• Connecticut Light & Power's new 42,800-kw Shepaug hydroelectric plant, on the Housatonic River at Newton, was recently placed in operation. The project, claimed to be the largest of its type in the state, raises the utility's generating capacity in hydro and steam to 605,350 kw.

VICTOR "Know-How"...

Gives You Purified Porcelain Suspensions...

America's Finest

VICTOR NO. 924
(EEI-NEMA TDJ-52-5)
25,000 LB. SUSPENSION
INSULATOR

VICTOR *Purified* Porcelain suspension insulators are laboratory designed to make them the finest in their field. VICTOR'S complete testing facilities, which include the industry's most modern impulse generator, certify to the soundness of their design.

Take the 25,000 lb. unit shown above, for example. It has rugged, rounded corrugations for maximum strength and resistance to impact. Cap and ball bolt, built to the most rigid specifications, are thick, husky and double-dip galvanized to withstand the severe service for which this insulator was designed. Scientifically fitted glaze, properly and uniformly applied, gives added strength . . . added protection against contamination. Each insulator is proof-tested mechanically, then subjected to vigorous high frequency and 60-cycle flashover tests. You just can't buy a better suspension!

SPECIFICATIONS

60-cycle dry flashover	80 KV
60-cycle wet flashover	50 KV
Positive impulse flashover*	125 KV
Negative impulse flashover*	130 KV
Dry arcing distance	7¾"
Leakage distance	11"
M and E strength	25,000 lbs.
Impact rating	60 in. lbs.
RNI	50 Microvolts
1000 KC at applied	10 KV

*Crest KV, 1½ x 40 microsecond wave Critical Valve.

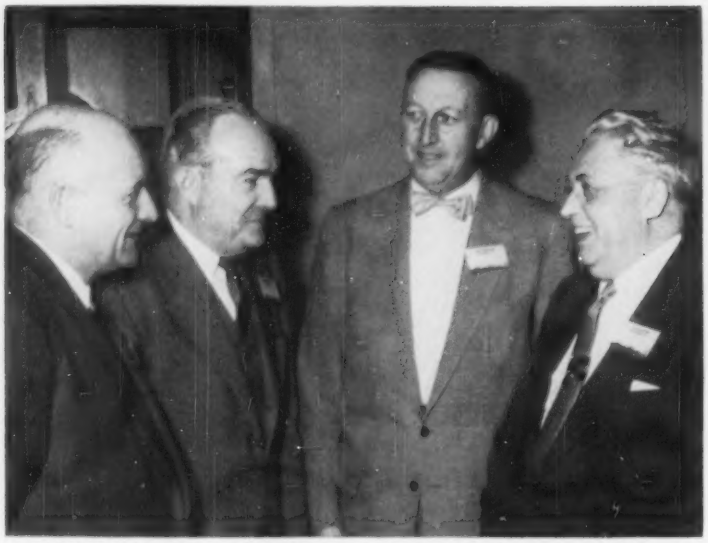
NEWS FROM VICTOR

These two booklets—"The Story of Victor" and Bulletin No. 4—contain a wealth of insulator information that has proved of tremendous interest to thousands of power men throughout the nation. If you do not have both in your files, ready for instant reference, send for them today.

SPECIFY VICTOR Purified Porcelain Suspensions!

VICTOR INSULATORS DIVISION
I-T-E CIRCUIT BREAKER CO.
VICTOR, N. Y.

Low and High Voltage Pintypes • Suspensions • Guy Strains
Spools • Switch and Bus Insulators • Custom Designed Porcelain
Insulator Hardware



NEW NELPA OFFICERS—Second Vice Pres J. T. Kimball, left, First Vice Pres Naughton, and Pres R. C. Setterstrom chat with WWP Pres K. M. Robinson

Public Power Can Be Averted

Corette tells NELPA solution is greater cooperation between utilities and other industries and more private facilities

Threat of a socialized electric power industry in the Pacific Northwest can be met by greater cooperation between utilities and with other industries and by development of more non-federal generating capacity.

In warning against a socialized industry, J. E. Corette, president, Montana Power Co, told the 48th annual meeting of the Northwest Electric Light & Power Association, Spokane, Nov. 17-18, that the choice of the type of government is the fundamental issue behind the public-private power question. He questioned that anyone could be naive enough to believe that a socialistic government would not follow a government-controlled power industry. Other industries, he emphasized, have not yet recognized this basic concept.

"Every business man in the United States has to join the 'offensive' ball team if we are to win," Corette said. He singled out the preference clause as a subject on which the industry must carry out a more effective public relations and educational program. The preference clause is being used to get the government to build more and more generating and transmission facilities.

About 7 million kw of non-federal capacity will be added in the Pacific Northwest during the coming decade, according to executives of NELPA member companies. June 1, 1958, is the target date for the first 90,000-kw unit at the Brownlee site in the Hells Canyon project, John Kimball, Idaho Power Co, reported. Three additional units will follow at two-month intervals. The 151,000-kw initial capacity Oxbow site will be started within the four-year limit of the FPC license and completed within two years while the 272,000-kw initial capacity Hells Canyon site will be started within six years and completed within three. Although insistence on a federal high dam at Hells Canyon is diminishing, said Kimball, Idaho Power will strive to get power on the line as soon as possible.

Timing must be considered in telling the public the merits of having local groups team up with the government to build the 1,125,000-kw John Day project, Fred Kempe, Portland General Electric Co, explained. Because of possible political overtones in an election year, local groups will continue to work for the project but not at the expense of jeopardizing other projects in the country.

Pleasant Valley and Mountain Sheep sites, totaling 1,080,000 kw initially, can be built by Pacific Northwest Power Co with very little delay when licensed by FPC, D. R. McClung, Pacific Power & Light Co, said if the projects could be started in March 1956, they would be on the line by the fall of 1959.

British Columbia Progressing

With a load growth that exceeded 10% annually since 1947, and approached 15% in 1954, British Columbia Electric Co capacity should be doubled within the next seven years, T. M. Ingledown said. By adding about 380,000 kw by 1961, B.C. Electric will raise its total mainland capacity to about 1,100,000 kw, compared with about 186,000 kw in 1948.

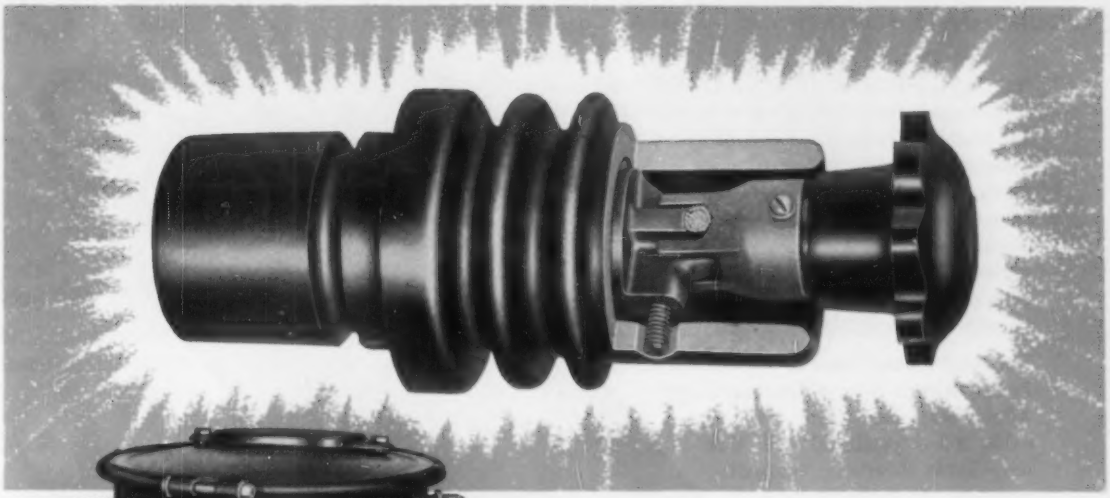
Western Washington utilities plan to develop about 1.7 million kw of new capacity to meet a doubling of load within ten years, according to L. E. Karrer, Puget Sound Power & Light Co. Within 15 years the area hopes to be able to supply its own needs without relying on annual appropriations and a federal government with an "obnoxious" attitude.

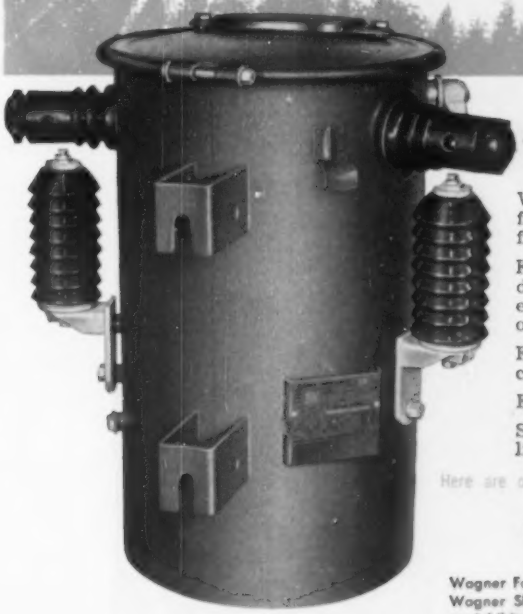
Utah P&L to Build 100-Mw Plant

An additional 100,000-kw steam station will be built as part of a $55-million dollar construction program in 1955-57, E. M. Naughton, president, Utah Power & Light Co, said. In addition, dump power may be bought by his company and Idaho Power Co from the Bureau of Reclamation's 114,000-kw Palisades project in southeastern Idaho.

According to a report from California Oregon Power Co, the eight-unit 152,000-kw hydro development on the North Umpqua River will be completed in 1956. Signing of a contract with the Bureau of Reclamation will make available to the company the power potential of the Upper Klamath River estimated at over 300,000 kw.

Make faster, easier, safer connections with Wagner FORM W Distribution Transformers





Shown above is a Wagner 10 kva 2400/4160Y—120/240 volt type MEB-1 protected distribution transformer.

HIGH VOLTAGE SIDEWALL BUSHING

Whenever you buy a Wagner Pole Type Distribution Transformer, you get a transformer with many important *extra* features.

For instance, the high voltage sidewall bushing, used in distribution transformers, 5 kv and below, that means faster, easier, safer *permanent* transformer connections for copper or aluminum conductor.

FASTER because the conductor is simply pushed into the connector and held tightly with a few turns of the knob.

EASIER because no tools are needed and...

SAFER because the knurled knob is insulated to protect the lineman from accidental shock when tightening the terminal.

Here are other EXTRA features of Wagner FORM W Distribution Transformers...

SHUR-SEAL COVER— INHIBITED OIL

Wagner Form W Transformers come with the Wagner Shur-Seal Cover and are filled with an inhibited oil. The Shur-Seal Cover makes a *positive* seal which prevents all contamination caused by injurious "breathing" of atmospheric moisture and dust particles. The inhibited oil reduces oxidation to a minimum and retards the formation of acids and sludge which can cause rapid transformer deterioration. Together, these features add years to the life of Wagner Form W Transformers.

LOCKED SECONDARY BUSHING

Positive position lock for both porcelain and terminal prevents loose connections on inside end of terminal studs and provides greater safety to linemen when connections are being made.

Write for your copy of Bulletin TU-180. It gives complete information on Wagner Distribution Transformers.

Wagner Electric Corporation EST. 1891

WAGNER ELECTRIC CORPORATION
6456 PLYMOUTH AVE., ST. LOUIS 14, MO., U.S.A.

BRANCHES AND DISTRIBUTORS IN ALL PRINCIPAL CITIES

ELECTRIC MOTORS
TRANSFORMERS
INDUSTRIAL BRAKES
AUTOMOTIVE BRAKE SYSTEMS— AIR AND HYDRAULIC

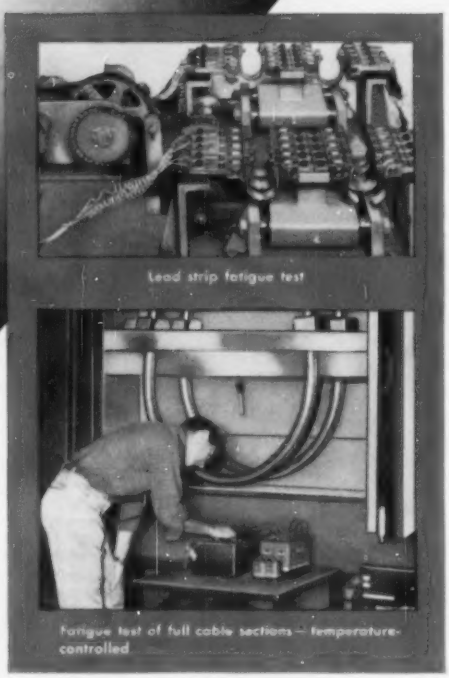
T55-6

ROEBLING PAPER POWER CABLE WITH TELLURIUM LEAD ALLOY SHEATH

TELLURIUM LEAD ALLOY SHEATHS MEET ALL REQUIREMENTS FOR FATIGUE RESISTANCE

TODAY'S HIGHER TEMPERATURES and increased loads are power cable problems met most satisfactorily and economically by Roebling Tellurium Lead Alloy Sheath. This sheath has absolutely top fatigue resistance; gives vastly increased service life despite severe bending stresses and cable movement during load cycles. Furthermore, Roebling Tellurium Lead Alloy has outstanding stability under heat—high temperature incurred at joints, terminations and in duct splicing cause no grain growth or physical impairment.

Roebling is unmatched in the breadth of its experience with Tellurium Lead Alloy Sheath and in the volume of cable it has produced with this remarkable sheathing. We will welcome the opportunity to send you Bulletin 205-B containing technical data on Roebling Tellurium Alloy Sheaths.



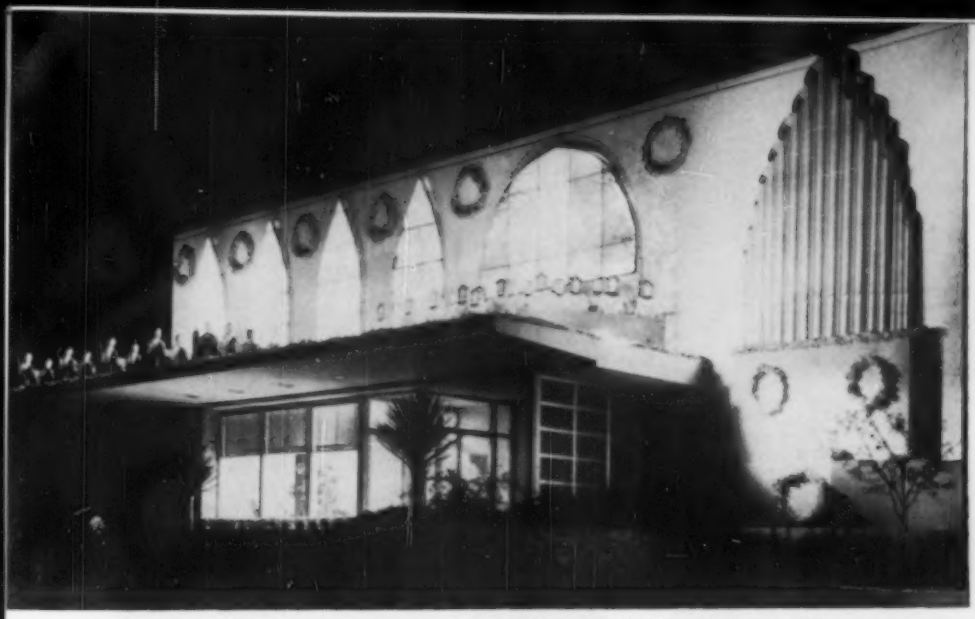
Lead strip fatigue test

Fatigue test of full cable sections—temperature-controlled

ROEBLING

Subsidiary of The Colorado Fuel and Iron Corporation

JOHN A. ROEBLING'S SONS CORPORATION, TRENTON 2, N. J. BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 11-15 STILLING ST. • CHICAGO, 5525 N. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 918 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 330 VINE ST. • PITTSBURGH, 1723 HENRY W. OLIVER BLDG. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, 19 RECTOR ST., NEW YORK 6, N. Y.

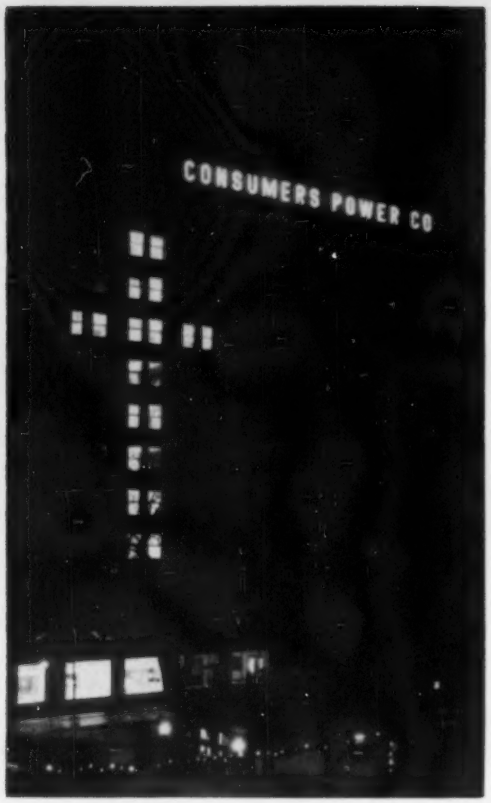


CHRISTMAS WORSHIP AT LOWER COLORADO RIVER AUTHORITY, AUSTIN, TEXAS

Power Will Sparkle the Season

STARS SHINE IN HONOLULU AS HAWAIIAN ELECTRIC CO's YULE DECORATION

CHRISTMAS TREE of lights glows daylight bright on the front of a Fifth Avenue department store in New York



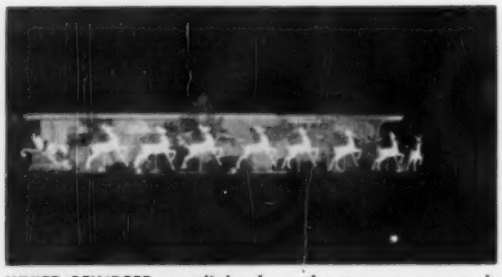
LIGHTED WINDOWS say "peace on earth, goodwill toward men" in this simple display in downtown Jackson, Mich.

Photo by San Francisco Chronicle

MASTS A'GLITTER bob with the waves in San Francisco's Yacht Harbor where boats are docked out for the holidays

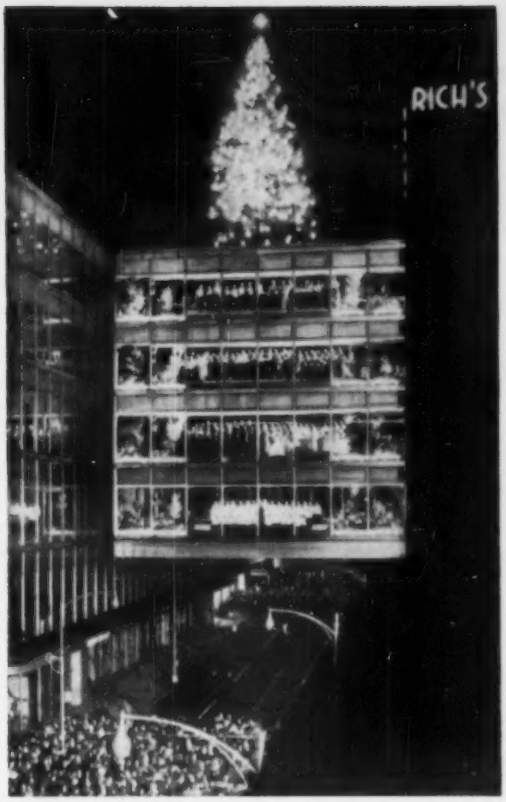
. . . for Lights Are an

From Los Angeles to New York, the



WHITE REINDEER, spotlighted on the terrace, prance in spirit of Donner and Blitzen around a Los Angeles home

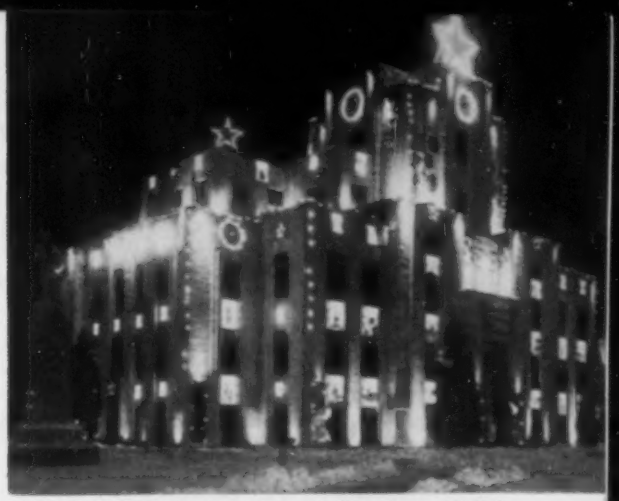
CANDLE-BULBS glow along walk and shine from windows lighting up this front yard snow scene in Minneapolis



CAROLERS AND TREES are lighted in tiers by an Atlanta department store to add its share of yuletide brilliance

American Tradition

nation is lighted for festive holidays



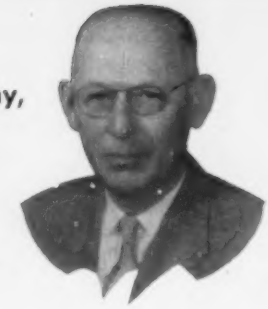
STARS AND GARLANDS transform Boulder County (Colo.) Court House into a mountain king's castle in the snow

GIANT CHRISTMAS CARD is one of many spotlighted on grounds of an electrical manufacturing firm in Ohio

GLOWING GROVE makes a Christmas tree setting for a home in Denver where evergreens are strung with lights

SANTA CLAUS and wreath designs adorn the windows of a house decorated for the holidays on Long Island, N. Y.

J. A. Siegfried, DISTRIBUTION ENGINEER
Pennsylvania Power & Light Company,



Tells HOW... and WHY... POLE STAR "CLUSTERS" ARE USED TO SUPPLY 3 PHASE POWER TO SHOPPING CENTER

Because of the compact Pole Star design, even 100 kva units can be cluster-mounted, as shown in this view of the installation described in Mr. Siegfried's letter. The Pole Star cluster is supplying three phase power to a shopping center.

In a letter to Ray Swoish, vice president of Pennsylvania Transformer Company, Mr. Siegfried says, in part:

"You will probably remember that we talked about mounting large size distribution transformers on a cluster mounting arrangement last year. Since then, we have installed quite a number of these jobs and have found that they do a quick and neat job.

"I am enclosing a photograph of a rather unusual installation which we erected in order to supply electric service to a shopping center in the town of Lemoyne across the river from Harrisburg, Pa. In order to avoid the installation of extremely heavy secondary wires, we made an installation of seven 3 phase banks on adjacent poles. The picture shows five banks; however, there are actually seven banks in a continuous line skipping only one pole. Each of these banks supplies two or three customers. These customers are stores and various other commercial enterprises which go to make up the shopping center.

"You will no doubt be pleased to see three 100 kva Pennsylvania Transformers mounted on a single pole shown in the foreground of this picture. There are five other Pennsylvania installations and one bank of (a competitive make)."

Pole Star Distribution Transformers—featuring the patented lap-on-top core—are available in all single phase sizes from 3 through 500 kva, 480 through 67,000 volts. The Pole Star line includes a 167 kva "Featherweight" with standard EEI-NEMA mounting provisions, and Protected Pole Stars (Type CSP) up through 100 kva.

POLE STAR

Pennsylvania Transformer Company
A McGraw Electric Company Division
CANONSBURG, PENNSYLVANIA • *Greater Pittsburgh District*

Engineer Salaries Higher . . .

. . . for graduates of Illinois Institute of Technology, survey reveals. Starting salary is $416 a month

Beginning salaries for engineers who graduate from the Illinois Institute of Technology continue to increase. This is shown by figures compiled by Earl C. Kubicek, director of alumni relations and placement.

The study shows that the starting pay of the 1955 June engineering graduate with a bachelor of science degree climbed to $381 a month as compared with $363 received by the 1954 June graduate.

This is a drop from the all-time high of $383 received by the January engineering class. But, Kubicek said, the differences in the size of classes and other factors account for the invariably higher starting wage received by mid-year graduates.

Averages, based on the starting salaries of combined June and January graduating classes at IIT, have increased every year since 1949 when the average was $282 a month. By 1955, it had jumped to $382.

For the first time, starting salaries of specific categories of engineers topped the $400, with 1955 June electrical engineers receiving $416.

A year ago, electrical engineers received $386, as compared with $390 in Jan. 1955. Here are the beginning salaries of some of the engineering categories:

Engineer	June 1954	Jan. 1955	June 1955
Electrical	$386	$390	$416
Civil	375	378	380
Mechanical	373	392	377
Industrial	356	358	371

All averages are based on a 40-hour work week and apply to engineering graduates with some practical experience, Kubicek said. He explained nearly all engineering students at IIT hold part-time or summer jobs provided by the placement office.

Averages are based on reports from 71% of the IIT engineering graduating class of 225. The remaining graduates are evening students (all of whom already held full-time positions), members of the Navy and Air Force Reserve Officers' Training Corps program, others who entered immediately into military service, and those who continued on into graduate school.

The latest mark, although an all-time high for total interviews, averaged only six interviews per graduate. The figure has run as high as nine per person in past years, Kubicek said.

"One of the more noteworthy trends pointed up by the latest survey is the desire by organizations to secure a greater number of engineering graduates for eventual advancement to managerial and supervisory positions," Kubicek pointed out.

Southern Cal Uses Name Plates

Name plates on line trucks are now being tried by the Southern California Edison Co to help identify the crew to other employees and the public. Foreman F. W. Partridge of the company is shown, above, pointing to the name plate which he suggested. These plates are being used in several of the Edison districts.

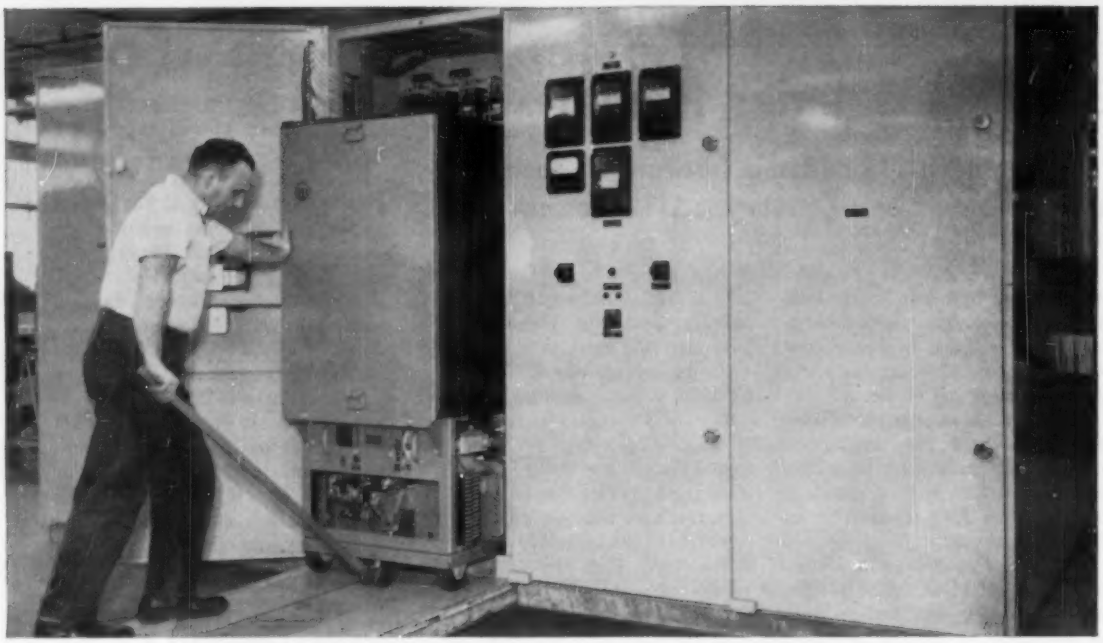
Power Editor Retires Will Be Consultant

Philip W. Swain, formerly chief editor and later a consulting editor of Power Magazine, a McGraw-Hill publication, will retire from the company on Jan. 1. He will devote his time to consultation as an independent industrial consultant in technical writing and speaking.

Dr Swain will serve each client company for several days in a round of "workshop" sessions and private conferences, showing company engineers how to translate technical jargon into plain English.

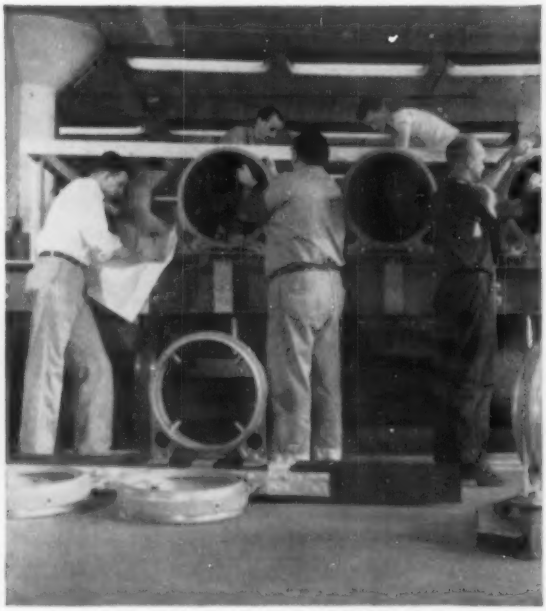
During his editorship of Power, he pioneered this clear and simplified kind of technical writing. His aim will be to show engineers how to write and speak so that people will read, listen, understand, and act.

He has also given many public addresses on this subject.

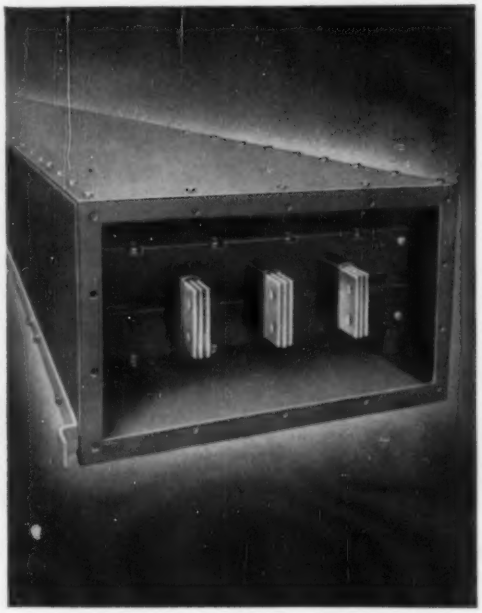


Metal-clad switchgear. Horizontal drawout air circuit breakers in rigid, all-welded enclosures. Available in ratings from 2400 v through 15 kv—50 through 500 mva interrupting and 2000 amp continuous.

NEW CONSTRUCTION ECONOMY TIP:



Isolated phase, metal-enclosed bus. For power generating stations. Available in ratings through 69 kv and 10,000 amp.

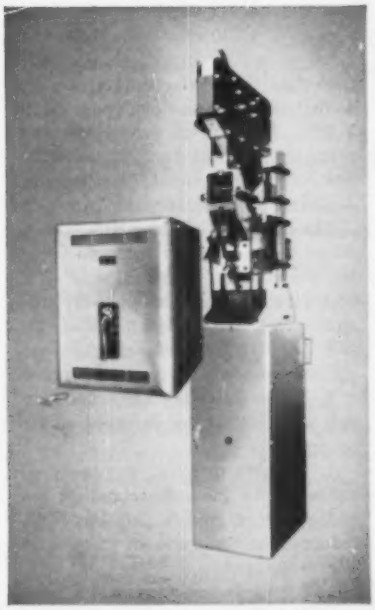


Nonsegregated phase, metal-enclosed bus. For switchgear connections. Available in ratings 600 v through 6000 amp; 5, 7.5 or 15 kv through 5000 amp.

Unit substations. I-T-E primary and secondary unit substations can be supplied for any application—indoor and outdoor—and in any standard rating.

Low voltage switchgear. For circuit protection. Commercial buildings, manufacturing plants, generating stations. Ratings through 600 v a-c, 250 v d-c, 6000 amp continuous, 15,000 through 150,000 amp interrupting.

BUY AN I-T-E "POWER PACKAGE"



Individual breakers. I-T-E large air circuit breakers are available in a wide range of types and ratings, 600 v a-c, 250 v d-c, 750 v d-c.

Coordinated engineering, delivery and installation means a better investment

An I-T-E "power package" includes the complete power handling facilities you need for a new construction project, building addition, or simple expansion of electrical service—one unit or a complete system for every application from generation to end use. You save many ways:

Sound planning. Talk with your local I-T-E application engineer about your general power requirements before you build. He'll work with you to determine the equipment needed to assure complete protection with greatest economy in total investment, operating costs, and construction time.

Easier installation. Before you begin construction, I-T-E will supply you with arrangement and channel base drawings. Equipment is factory assembled, tested and ready to install. Standardized frames and panel elements assure that future additions to your switchboard will match and line up.

Coordinated delivery. Shipments are made from I-T-E according to a predetermined schedule. Each part of the complete "power package" is delivered to the job when needed. This saves delays and eliminates inconveniences.

Assured performance. Since I-T-E will supply all equipment—pre-engineered—you are saved the work of coordinating equipment of different manufacture. You can be sure that the separate parts of an I-T-E "power package" will fit and function together.

For details, contact the I-T-E sales office nearest you—look in your classified directory under "Electric Equipment." I-T-E Circuit Breaker Company, 19th & Hamilton Sts., Phila. 30, Pa.

I-T-E CIRCUIT BREAKER COMPANY
Switchgear Division

'56 Air Conditioning: Higher PF, Less Amps

Air conditioning manufacturers, optimistic about their fate in '56, have come up with some more-than-routine innovations in their lines for next year. With preview showings about over, here are the items of most interest to power suppliers:

• Most manufacturers will meet their agreement with the industry to boost power factor.

• General Electric's models have been thinned down to point where it claims there is no noticeable projection either outside the building or past the drapery line inside. All its models will have pf of better than 90%.

• Fedders, the biggest maker, says it will get around the wiring barrier with a 7½-amp, ¾-hp room cooler which it claims uses 40% less current than a conventional unit yet delivers the same cooling capacity as the conventional 12-amp room model. Vornado has a 7½-amp, ½-hp unit.

• Westinghouse will feature an illuminated control panel and electronic air cleaner. It has announced plans to buy back excess dealer inventories when weather is cool and sales sag.

• York has a new "snorkel" unit which "breathes" through a nine-in. air intake which does not extend beyond the windowpane and consequently does not block the view. It can be used either as a fixed unit or can be wheeled around the room.

Other trends: More models which fit either casement or sash windows or can be installed "through the wall"; wider choice of reverse-cycle units and central systems.

Many makers will raise their prices next year, but hot competition may keep the cost to the consumer down.

As for '56 sales, George S. Jones, Jr., managing director of the Air Conditioning and Refrigeration Institute, says they could hit 1.5 million room coolers compared to an estimated 1.3 million this year—provided next summer's weather is warm enough.

Four-in-One Booth Displays Lighting

Lighting for four different areas of the home was displayed in four-section booth by Arizona Public Service Co at Appliance Merchandisers Association's annual fall festival. Featured were lighting arrangements for patio and garden, bathroom, study area, and general illumination. A patio setting in the outdoor section contained a barbeque, trees, and plants to provide a background for portable lighting pieces. General lighting section took up major portion of the display. It showcased formal, traditional and contemporary fixtures in various decorative lighting effects. In the bathroom section, an old-style bulb fixture placed directly over the medicine cabinet mirror was contrasted with fluorescent fixture on ceiling and either side of cabinet. In the study area, two applications of desk lighting included two wall pin-up lamps and a fluorescent-lighted shelf on the desk itself. Display was 48 ft long and about 10 ft deep to provide nearly 500 sq ft of floor space.

South Carolina E&G Goes to Quick Recovery

South Carolina Electric & Gas Co will join the 22% of the nation's utilities who promote quick recovery water heaters.

According to Allan C. Mustard, general manager of commercial electric operations, the SCE&G-approved unit will have a maximum allowable wattage of 4,500 w in the top unit and 2,500 w in the bottom. They will be controlled by interlocked thermostats so that only one unit can come on at a time. Location of thermostats and heating units will be in accordance with National Electrical Manufacturers Association specifications.

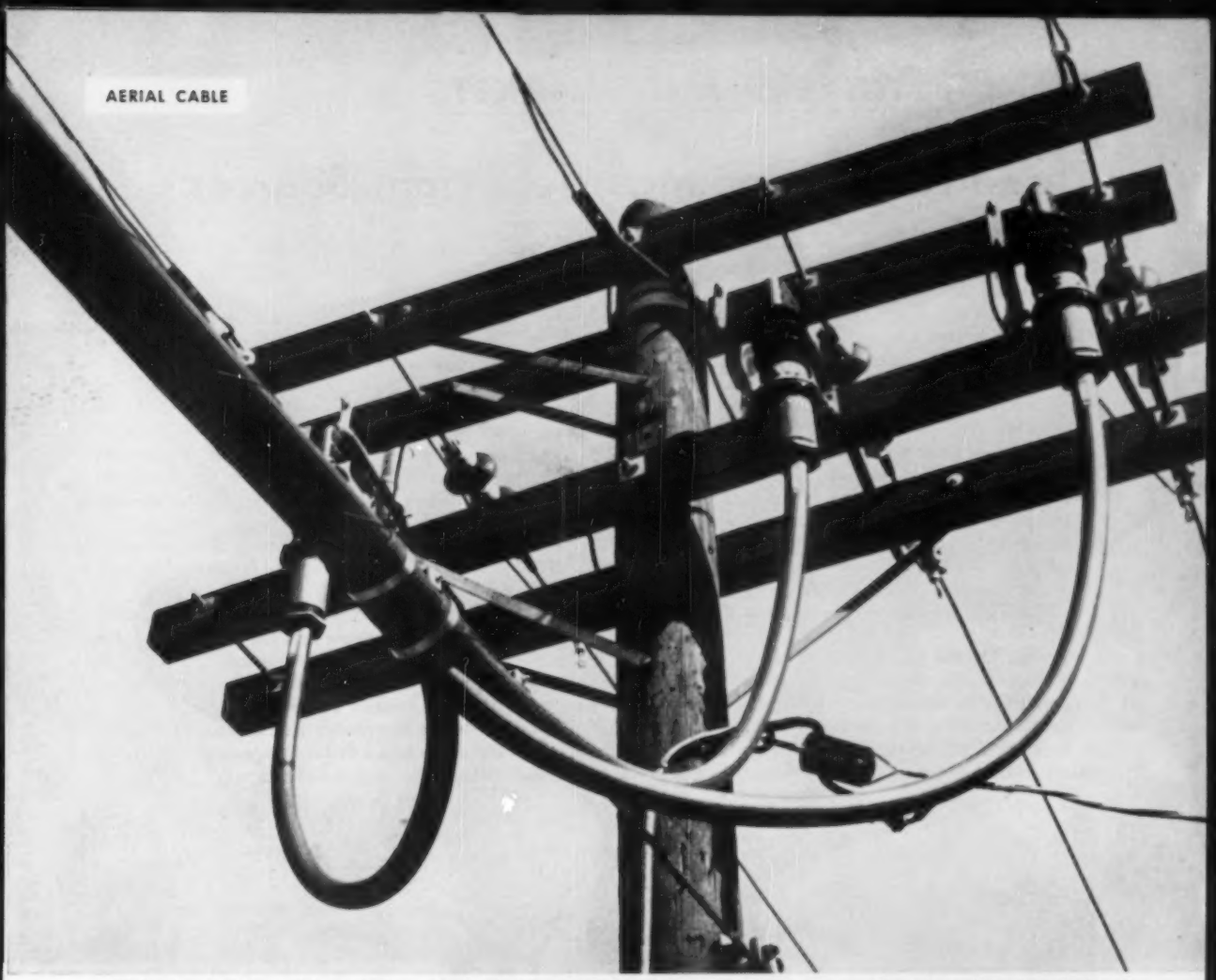
The company will standardize on a 40-gal tank for both round and counter top models. Mustard says it is hoped the move to quick recovery promotion will accomplish three things:

1. Supply ample hot water for average requirements.

2. Make electricity fully competitive with bottled gas in speed of recovery.

3. Help the manufacturer to standardize on 40 gal units, eliminate the multiplicity of models, and thus effect reduction in price and an increase in sales volume.

The company is now setting up a coordinated quick recovery promotion program with dealers and distributors in its service area.



High-ozone resistance of Anaconda Type AB-insulated cable pays off here where ozone-cutting is often a problem when ordinary insulation is used.

New aerial cable gives ozone the air

New Anaconda Type AB-insulated cable has *highest* resistance to ozone.

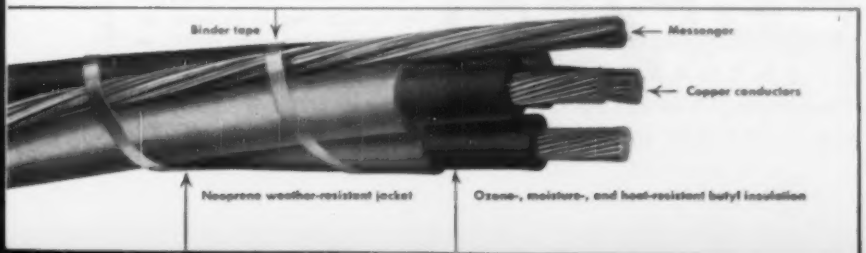
Ozone-cutting — No. 1 enemy of high-voltage insulation — can be arrested.

ANACONDA Type AB butyl insulation on aerial and other high-voltage cable ends this problem.

Type AB is *inherently* resistant to ozone. Moreover, this high resistance to ozone has enabled Anaconda engineers to concentrate on other properties — to develop Type AB's other electrical and physical properties to the very peak of performance.

Proof is in a series of tests — made over a period of years by Anaconda engineers. These tests — covering ozone, temperature, moisture absorption, dielectric strength, ionization level, aging, and other properties — show clearly the superiority of ANACONDA Type AB butyl insulation.

Put your cable problems up to the Man from Anaconda. Anaconda Wire & Cable Co., 25 Broadway, New York 4, N. Y. 65556



ANACONDA®

AERIAL CABLE

Three Firms Announce New Light Sources

Three manufacturers recently unveiled new developments in light sources. Within seven days (Nov. 29-Dec. 5) these new lamps were announced:

Duro-Test Corp, North Bergen, N. J., reports its Fluomeric lamp combines incandescent, fluorescent and mercury-vapor principles. The manufacturer says the lamp incorporates positive features of the three light sources and eliminates their negative features.

Fluomeric has a life of 12,000 hours, efficiency of 25 lumens per watt, and highly true color spectrum, declares the manufacturer. The lamp is recommended for highway, industrial, commercial and household applications. It screws into ordinary sockets and does not need an external transformer.

Duro-Test President Walter Simson declared that the company "has not yet fixed a price on the new lamps nor determined an exact date when they will be put into production."

General Electric Co, Nela Park, Cleveland 12, Ohio, says that its new filament design gives increased light output of 6-15% without requiring extra electricity.

This is achieved by: Improving basic design of the tungsten filament; positioning the filament lengthwise, or axially, in the bulb; and substituting for the first time coiled-coil for singly coiled filaments in lamps of 300 watts and larger.

Axial positioning permits the filament to burn at higher temperatures without shortening operating life. The axial filament also concentrates bulb blackening in a smaller area, thereby emitting more light.

These changes, GE reports, give lamps of 300 watts and larger an added output of 15%. Household sizes, already using coiled-coil filament, will have 6% added output.

The lamp is now available in 750 and 1,000-watt sizes, while the 500-watt bulb is expected to be on the market in February. GE says these developments will be extended to other ratings in a few years.

Westinghouse Electric Corp, Bloomfield, N. J., introduced a new line of heavy-duty mercury and fluorescent-mercury lamps.

An outer bulb of heat-resistant special glass permits heavy-duty indoor and outdoor use. The company says the Weather Duty lamp can be operated wherever exposure to corrosive vapors, moisture, thermal change, or slight mechanical hazards requires a heavy-duty lamp.

The lamps are now available as alternates to standard lamps in 400 and 1,000-watt sizes, including E-H1, J-H1, A-H12, C-H12, A-H15 and B-H15 lamps.

New Aluminum Plant for Anderson Brass

Construction of a modern aluminum foundry for Anderson Brass Works, Inc, was started when first dirt was turned by R. E. Schuler, president (with shovel), and T. H. Fox, vice president (with pick) of the company. In making the announcement of the new plant, Schuler stated that all future expansion of Anderson's facilities would be at Leeds, Ala.

Anderson's new aluminum division will be on a 20-acre site at Leeds, 14 miles east of Birmingham. One building will have approximately 11,200 sq ft for manufacturing, assembling, and storage space. Another building of 2,000 sq ft will house the pattern shop. First shipment of Leeds production is anticipated in March, 1956.

Facilities will provide for the melting of 3,750 lb of metal per hour with 10 molding stations providing for 361 molds per hour. A mold conveyor will handle over 400 molds per hour. Provisions have also been made for floor and shell molding.

The aluminum foundry will feature modern mechanization such as conveyorized handling of sand, molds, and castings. An overhead crane will move the castings in and out of the heat-treating furnaces.

Record Attendance

About 25,000 persons from 42 cities were on hand when General Electric Co recently introduced its new incandescent lamp. GE used a closed-circuit television hook-up to display its latest development. For more details on the lamp, see story on this page.

(*More M&M on page 59*)

Specially shaped porcelain disk, flashing over at 67,500 Volts

The Shape of Things to Come

Coming...440 KV...500 KV transmission systems!

Who knows how insulators will behave at such voltages? Is it possible that presently accepted insulator shapes should be revised in view of special demands made by voltages of 400,000 and up?

It's our job to find out . . . and that's what we have been doing in our High Voltage Laboratory. In this case, we are re-examining the whole concept of insulator shape.

We are asking ourselves this . . . and many other provocative questions, as part of our constant search for new information on high voltage insulation problems. It is part of our service to the electric power industry.

LOCKE

LOCKE DEPARTMENT
GENERAL ELECTRIC COMPANY
BALTIMORE, MARYLAND

handled with care!

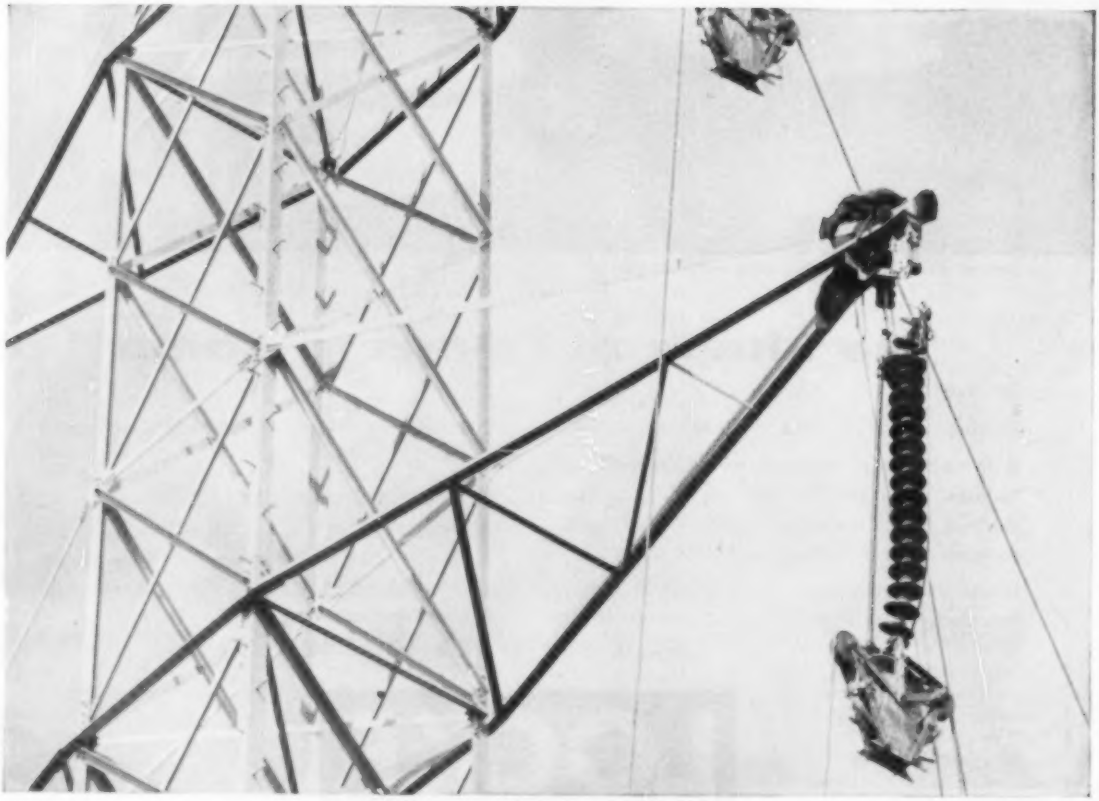
Use of a metal cradle protects those O-B Suspension Insulators while they're hoisted to the cross-arm. Such care shields every insulator from rough treatment; makes sure each string goes into service in factory condition. Careful handling by the builder is only to be expected, after choosing best-quality materials for this 330-kv line. Successful transmission at extra-high voltage depends on first-class materials in first-class condition.

On this job where materials *must* be right, it is significant that O-B Suspension Insulators and hardware are used, just as they have been chosen for use on every other extra-high voltage transmission line operating or under construction in the Americas! Ohio Brass Company has earned this confidence for its products in a half-century of design and production of insulation of the highest character.

Ohio Brass Company • Mansfield, Ohio

Ohio Brass

4544-m



Simple, sensible protection delivers O-B Suspension Insulators to the crossarm in factory condition.

Joslyn, PINCO Observe 35th Sales Anniversary

Porcelain Insulator Co, Lima, N. Y., and Joslyn Mfg and Supply Co, Chicago, Ill., jointly observed the anniversary of 35 years association between manufacturer and selling agent of PINCO insulators.

In a brief ceremony to mark the occasion Leo B. Harvey (right), president of PINCO, presented his company's 10-millionth suspension insulator to P. W. Lotz, president of Joslyn.

A-C Circuit Breaker Film Depicts Hydraulic System

A new color sound film strip, released by Allis-Chalmers Manufacturing Co, describes the development and operation of a hydraulic system for actuating circuit breakers.

Titled "Success Story," the 15-minute, 35-mm film portrays three major problems and how they were solved in designing the system for circuit breaker operation.

Simplified diagrams of the hydraulic circuit show the nine essential elements in the Pneu-Draulic operator's system. Valve positions both during closing stroke and as the ram is returning from the closing stroke are also pictured.

Film requests for showing before engineering societies and utility groups may be made at any Allis-Chalmers industries group sales office.

Aluminum Production

Primary production of aluminum in U. S., according to the Aluminum Association, New York, was 134,656 tons in October. This tonnage is an increase of more than 4,000 tons over Sept., 1955, and about 9,500 tons more than in Oct., 1954. For the first 10 months in 1955, total production was 1,291,347 tons. This is an increase of about 89,000 tons over 1,202,278 tons for the same period in 1954.

Resistance Welder Orders Continue to Increase

Monthly figures supplied by members of the Resistance Welder Manufacturers' Association continue to reflect a substantial increase in new orders and shipments. The recently compiled October report indicates that new business for the first ten months of 1955 is 31% ahead of orders received during that period last year.

Shipments of welders for the same ten months have increased 17% over the same period in 1954.

Cory Buys Mitchell Stock in Air Conditioner Merger

Cory Corp and Mitchell Mfg Co, both appliance firms of Chicago, have merged; former firm purchased all capital stock of the latter. No purchase price was disclosed. The merger will form one of the largest manufacturers of room and packaged air conditioning equipment, according to J. W. Alsdorf, president of Cory Corp.

Mitchell will be a separate and distinct subsidiary of Cory. "Current Mitchell distributors and dealers will remain the same," said Alsdorf.

Polyethylene Boosts Life of Exide Storage Batteries

Use of polyethylene for tubing and tube sealers increases life and capacity of its industrial batteries, Exide Industrial Division of Electric Storage Battery Co reported recently.

The company expects a boost of up to 20% in battery working life and continuing increases in capacity without added space requirements.

Only polyethylene will be used to encase active material and grid spines of positive plates of Exide-Ironclad batteries. The company stated that use of the plastic follows years of research, testing and successful use.

M&M BRIEFS

Square D Co and Electric Controller & Mfg Co have called special stockholder meetings for Dec. 28 to vote on merging the two companies (EW,-Nov. 21, p 56). Two-thirds of the holders of both companies must approve the proposal for the merger to take effect. Directors of both firms recently okayed the merger.

Datamatic Corp moved into a new plant in Newton Highlands, a Boston suburb. It is engaged in development and production of large-scale electronic data processing machines for business and government use. The corporation is owned jointly by Minneapolis-Honeywell Regulator Co and Raytheon Manufacturing Co.

CE to Build Nuclear Engineering Center

Combustion Engineering, Inc, plans to build a $5-million Nuclear Engineering and Development Center on a 530-acre site in Windsor, Conn., advises Broderick Haskell, vice chairman of the company.

The Center will comprise facilities for the complete design and development of nuclear power reactors, for the construction of reactor cores, and for the manufacture of related atomic fuel elements. The administration and engineering building will be started shortly. Stone & Webster Engineering Co, are the architects and engineers.

All "heavy" reactor work will continue to be done in the company's main manufacturing plant in Chattanooga, Tenn., (EW, Sept. 19, 1955, p 265) where reactor components have been fabricated.

In commenting on the contract recently awarded by AEC for a submarine reactor system, Haskell pointed out that the company thus became the third major contractor to enter the naval reactor development program. And, he continued, the company would be the first in the country to design and construct a complete naval nuclear reactor system with its own facilities.

BUSINESS OUTLOOK

Electrical World
DECEMBER 19, 1955

The outlook in brief: With Christmas approaching it's timely to look back, thankfully, to see the progress we've made, and to look a bit ahead—even beyond next year. **Since 1945 we've done amazingly well. There's been an annual rate of growth in output of 3.6%. And in no year have we varied more than 4% from the main line of progress.** If we continue to do this well we'll reach a $415 billion Gross National Product by 1957, a $460 billion one by 1960. Should this happen, **improved investment planning by business will take a large share of the credit.** In any case, **there are good reasons for believing that business will continue to operate in a strong and relatively stable economy.**

Business investment in new productive facilities used to be the main source of business instability. This is no longer so. Looks now as if such investment will be one of the more stable things in our economy. Main reasons for this are two: **Businesses are now planning their investment programs much further ahead.** Actual year-to-year investment outlays are based less on current sales developments—more on long term growth prospects. **Other reason is the tremendous volume of research being done these days: about $4 billion a year.** New products, processes and innovations of all kinds are being turned out so fast that no company dares to stand still. Especially with the danger of new-style "diversification-mergers" bringing tough competition into stagnant industries from the outside!

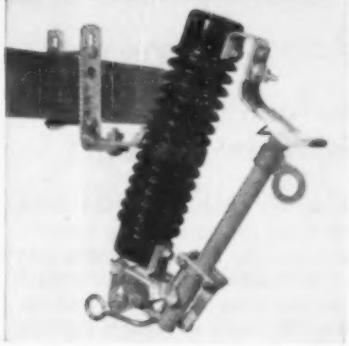
Housing, too, should be less unstable than in earlier decades. With rapidly rising population, demand should stay high, providing mortgage credit remains available on liberal terms. The economy will also derive a strong and steady lift in working off the **sizable and urgent backlogs in public construction:** roads, schools, urban redevelopment, etc.

Incomes should rise correspondingly. Investment is dynamic: it creates employment and income. And we have some pretty potent **built-in gimmicks** to make sure that spendable income will rise when production rises, and that it won't fall far, if and when production declines. Among these devices, are the annual rounds of **wage bargains, farm price supports,** and **social security benefits,** not to mention the increasingly popular practice of passing **tax cuts** any time buyers seem to be running out of spending money.

All this doesn't mean, of course, that every month or every year will automatically be better than the preceding one. There are still bumps ahead. But we've good reason to hope that the wild, destructive swings of the past will be avoided. **Chief sources of instability now are three:** One, we've by no means licked the **inventory cycle** as yet. Two, **shifts in consumption** can still be pretty unsettling, despite advertising pressures. Consumers spend, and save, varying proportions of their incomes: they'd be spending $7 billion less today, for example, if they were still saving at the same rate as in early 1954. And their reaction to a new car model can set the key for prosperity. Finally, we must not forget the **built-in instability of the international world.**

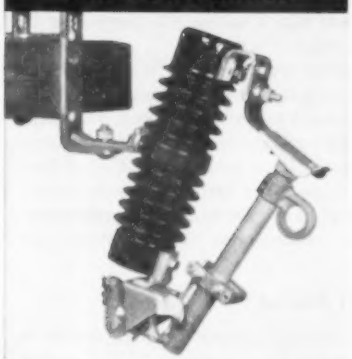
The big ups-and-downs in the last decade have come from rapid changes in defense plans. We can't be sure there won't be more of them. Further defense cuts, if they were safe to make, would of course be welcome, however tough it might be temporarily, to adjust to them.

NEW HEAVY-DUTY RATING



4000-AMP INTERRUPTING RATING of new 15-kv, 100-amp unit extends range of application of open drop-out cutouts to more points on the distribution system.

HEAVY-DUTY RATING



5000-AMP INTERRUPTING RATING is provided by 7.8-kv, 100-amp unit. Like 15-kv unit it features heavy-duty fuse holder, can be equipped with 100-amp load break or 200-amp disconnect blade.

Now . . . 15-kv, heavy-duty interrupting rating added to G-E open drop-out cutout line

New unit has 4000-amp rating also available with load break

Now you can provide *more dependable* yet *economical* overcurrent protection of equipment *at more points* along your distribution system where the advantages of open-type cutouts are needed, with a General Electric open drop-out cutout.

HEAVY-DUTY RATINGS include the new 15-kv, 100-ampere cutout, with an interrupting rating of 4000 amperes and the previously available 7.8-kv, 100-ampere unit with a 5000-ampere interrupting rating.

STANDARD-DUTY RATINGS include the 7.8-kv, 100-ampere unit with its interrupting rating of 3000 amperes plus the 15-kv, 100-ampere unit with a 2000-ampere interrupting rating.

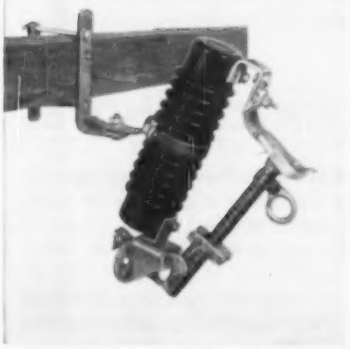
ALL UNITS can be provided with 200-ampere disconnect blades. And all offer the many outstanding design features that have always made G.E. your best cutout buy . . . interchangeable fuseholders in each voltage rating . . . silver-plated contacts . . . birdproof construction . . . compression clamped top and bottom fittings and hanger support . . . permanent high-pressure contact and latch . . . "can't miss" hinge guides . . . and many others.

For complete information on these open drop-out cutouts, contact your nearest G-E Sales Representative, or write to General Electric Company, Section 433-14, Schenectady 5, New York.

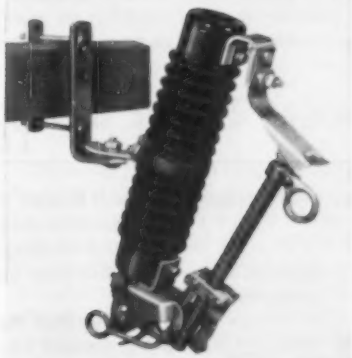
Progress Is Our Most Important Product

GENERAL ELECTRIC

STANDARD-DUTY RATINGS

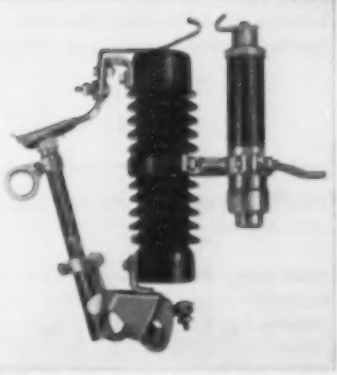


3000-AMP INTERRUPTING RATING of 7.8-kv, 100-amp unit meets NEMA standards. Interchangeable with 7.8-kv heavy-duty fuseholder.



2000-AMP INTERRUPTING RATING of 15-kv, 100-amp unit has been retained. It can be equipped with 100-amp load break device or 200-amp disconnect blade.

COMBINATIONS



COMBINATION of 7.8-kv open drop-out cutout and 9-kv Hi-stroke arrester can be purchased at less cost than units purchased separately.

What Is Your Reliability Target?

Utilities seek standards for service reliability, but further study required. Meanwhile methods evolve for cutting spread, duration, frequency of outages

"Service reliability" could well be the key phrase in the industry. Improving service reliability is the aim of management, the task of engineers, and the requirement of the customers. The all-electric home and the automated factory bring ever-increasing demands for higher quality service.

To find what utilities are doing about this, Electrical World recently queried a number of men in the distribution field. Question was put to them in this form:

"Do you have any standards in your company for outage duration, frequency of outage, and the largest number of customers that can be lost at once? In other words, what are your prerequisites for system planning?

What Industry Men Say

Here are some of the comments from men in the industry:

W. N. Carlson, Niagara Mohawk Power Corp: "More should be done on this subject. We have no real set-out policies on this. We do operate on an Mva-mile basis. Distance times load should not be greater than 100 Mva-miles on subtransmission. If it is, we sectionalize the line."

B. M. Gallaher, Texas Electric Service Co: "There are no standards like that for system planning in the Southwest. However, this same question was discussed recently at Austin, Texas, at the Distribution Power Conference. We think that this is a pertinent factor in distribution planning and design and wish that a yardstick would evolve."

A. Bjorklund, United Illuminating Co: "We place pins in a map to indicate outages of primary circuits. Pin clusters show where trouble is most frequent. When situations warrant it, we install aerial cable, tree wire, or fuse cutouts. We also respace circuits."

A Cincinnati Gas & Electric Co engineer replied that his company is working on a plan whereby IBM punch cards will be used to record transmission and distribution troubles of various kinds by areas. The company always has kept detailed records of failures and troubles on its system, and this experimental use of IBM cards is an attempt to improve tabulating and summarizing methods, rather than being a new plan for measuring system performance. Averages of the number of customers affected by each type of trouble have been worked out, and can be applied to each case. The cards will enable the data to be summarized in a number of ways and—within the limits of accuracy of the averages—enable engineers to determine the reliability of the system as a whole and in each selected area.

A northern utility engineer declared that his company puts up to 10,000 kva on a radial tap before bringing in another spur. In this case, the utility relies heavily upon fuse coordination and reports that it has no real trouble on its distribution lines as a result.

Another utility queried replied that it is interested in developing a practical way of measuring customer outages which can be used as an aid in system planning. This company currently tabulates each month all outages involving 100 or more customers or 10 or more miles of rural line. Cause of the outage is described briefly for each outage. These reports are checked to determine equipment performance and to spot unsatisfactory line conditions that should be corrected.

Need for Standards Voiced

Most of the distribution men questioned were unable to report what they considered real "standards" for system planning. Their answers usually were prefaced with, "Well, we don't have any standards along the lines that you're talking about, but we do have—." Then they would describe the particular aspect that came closest to it, most of which are reported here.

But virtually all of the respondents ended by saying that they felt some practical method of determining service reliability should be worked out and that some standards then should be set up to guide the planning engineer as he seeks to serve his company and his customers.

TECHNICAL NOTES

First line of attack in effective maintenance is well-trained crew leaders.

Solar energy will gain a place in under-developed and non-industrial countries long before it begins to supplement other energy sources in the U.S.A.

Supersonic movement at high altitudes (30,000 ft) requires refrigeration to preserve human life. Friction at 3 times the sonic barrier boosts temperature 650F compared with only 75F at 700 mph.

Clay soil beneath building foundations shows no tendency to accumulate moisture in excess of that outside the buildings. But landscaping should be selected and placed to avoid disturbing the clay near shallow foundations.

Extending steel stacks to avoid atmospheric pollution by power stations accents their susceptibility to wind-excited vibration, generally in a direction perpendicular to wind direction. Amplitude increases with wind velocity, but frequency remains constant at the natural resonant frequency of the stack.

FINANCE AND REGULATION

Summary of Accounting and Rate-Making Treatment of Liberalized Depreciation for the Industry (Part II)

Number of commissions issuing orders 12

Number of orders issued 16

Analysis of accounting orders issued:
- Restricted or appropriated surplus 7
- Tax reserve 7
- Denial of application 2

State	Company	Date of Order	Accounting Disposition to Income	Accounting Disposition to Balance Sheet	Comments
Ohio	Ohio Power Co.	9/9/55			Company proposed restricted surplus method of accounting. Commission disallowed application on the grounds it ". . . could be detrimental to sound public utility regulations . . ." Order inferred that the tax deferral was really a permanent reduction in taxes.
	Cincinnati G&E Co.	9/12/55			(As above)
	Cleveland Electric Illuminating Co.	9/13/55	Charge to Provision for Special Reserve	Special Reserve	Order heavily qualified in language. Commission noted that it ". . . reserves for further determination the particular other liability account, if any, to which such 'Special Reserve' shall be transferred."
Oklahoma	Public Service Co. of Oklahoma	7/18/55	Sub % of 507	Restricted Surplus	Commission, in its findings, noted the economic similarity between accelerated amortization and liberalized depreciation and that consequently the accounting treatment should be the same.
Virginia	Appalachian Electric Power Co.	6/6/55	Sub % of 507	Restricted Surplus	This order followed the West Virginia order for the same company and is identical with it. Commission noted that intent of Congress was to promote economic activity by making funds available through the deferral of taxes arising from the liberalized provisions of the 1954 Internal Revenue Code.
W. Va.	Appalachian Electric Power Co.	5/26/55	Sub % of 507	Restricted Surplus	(Same as order of Virginia State Corporation Commission)

Compiled by EBASCO Services, Inc.

Tacoma City Light Plans to Sell $5 Million Bond Issue

Subject to routine approval by the City Council, the Public Utilities Board of Tacoma, Wash., has set Jan. 10 as the date for the sale of a $5 million City Light revenue bond issue to take care of part of its construction program.

The sale will provide funds for the purchase of transformers and other electrical equipment costing a total of $2 million to enlarge the substation which receives power from the Bonneville Power Administration. In addition, new steel towers will be erected to replace present wood poles supporting transmission lines from the Cushman power plants, about 60 mi from Tacoma. Also included are new substations, reconstruction of parts of the Seattle-Tacoma inter-tie and other distribution facilities, said Utilities Director Dean Barline.

In other actions, the Board approved contracts totaling more than $350,000 for City Light equipment. Eight firms received awards totaling $250,000 for transformers, as follows: General Electric Co, Love Electric Co of Tacoma bidding on Allis-Chalmers equipment, Westinghouse Electric Corp, and Demick Electric Supply Co of Tacoma bidding on Line Material equipment, each $52,500; Central Transformer Corp, W. G. Mills Co, Wagner Electric Corp and Electric Motor Service Co, each $10,000.

Inland Empire P&L Cuts Rates Effective Dec. 1

Approximately 7,300 consumers of the Inland Empire Power & Light Co, an electric cooperative in eastern Washington and northern Idaho, received reductions in rates on Dec. 1. The new schedule reduces the minimum monthly charge from $1.80 to $1.20 for 30 kwhr, a reduction of one-third.

The cost of the next 10 kwhr has been cut from 6 to 4¢ per kwhr. Other rates are unchanged.

The reduction for Inland customers was the sixth in 18 years, and marks a cut of 37% in rates for the first 300 kwhr and 57% for additional consumption since the co-op began operation in 1938.

Inland operates in areas of Pend Oreille, Spokane, Whitman, Garfield and Stevens counties, Wash., and in Bonner County, Idaho.

PUD Seeks $50,000 New Capital to Expand

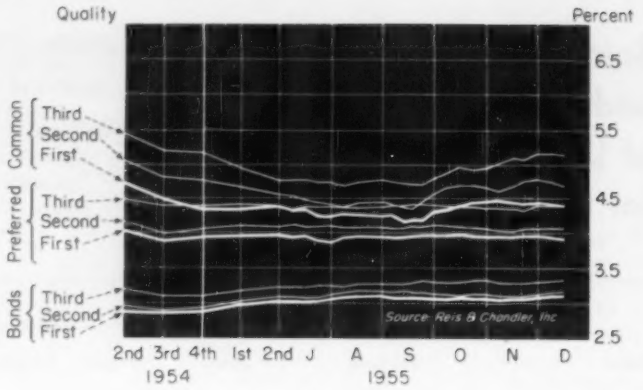
Budget of the Benton County PUD of Prosser, Wash., for 1956 includes $480,000 for construction, Manager Owen Hurd has announced. It will be financed from $430,000 in current revenue and about $50,000 in new capital.

The PUD anticipates revenue of $1,566,000 for the year, an increase of 5% over 1955 but somewhat lower than previous years because of rate reductions made last spring. Revenue for September and October declined 5% from a year ago, because of the rate reduction.

FINANCIAL BRIEFS

Illinois Commerce Commission has approved a petition filed by both the Commonwealth Edison Co and Central Illinois Light Co to transfer properties with revenues of about $2.1 million each per annum. Transfer will take effect on Jan. 1. Edison will acquire electric properties of Central in DeKalb-Sycamore area which is surrounded by Edison service area. Central Illinois Light will assume Edison properties in the area around Peoria, Ill.

Today's Utility Yields (%)



	BONDS			PREFERRED STOCKS			COMMON STOCKS		
QUALITY	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd
Dec. 8	3.11	3.15	3.31	3.94	4.06	4.38	4.39	4.70	5.13
Dec. 1	3.11	3.14	3.29	3.95	4.06	4.38	4.41	4.72	5.15

Utility Earnings

COMPANY	PERIOD MONTHS ENDED		NET INCOME 1955	NET INCOME 1954	EARNINGS PER COMMON SHARE 1955	EARNINGS PER COMMON SHARE 1954
Black Hills Power & Light	12	Oct.	$704,305	$604,797	$2.16(a)	$2.12(a)
Central Illinois Light	12	Oct.	3,806,080	3,530,453	3.30	3.03
Central Maine Power	12	Oct.	6,892,140	6,690,843	1.82	1.50
Dallas Power & Light	12	Oct.	7,148,598	6,028,883	.....	.....
El Paso Electric	12	Oct.	2,068,914	2,144,800	2.31	2.43
Ohio Edison, consolidated	12	Oct.	23,030,995	19,933,574	3.49(b)	3.00(b)
Public Service of Indiana	12	Oct.	12,633,680	12,093,834	2.40	2.35
Texas Power & Light	12	Oct.	10,443,163	10,206,909	.....	.....
West Penn Electric, consolidated	12	Oct.	17,072,451	15,561,159	2.02	1.84

Notes—(a) Based on 262,140 shares in 1955 and 250,261 shares in 1954, and (b) Based on average number of shares outstanding.

Utility Financing

COMPANY AND DESCRIPTION	AMOUNT OF OFFERING (000)	OFFERING PRICE	YIELD TO PUBLIC
DECEMBER 8–14			
BONDS			
Connecticut Light & Power—1st mtg 3¼% due 1985	$20,000	99.5%	3.275%
Delaware Power & Light—1st mtg 3¼% due 1985	10,000	102.824	3.35
PREFERRED STOCK			
Delaware Power & Light—50,000 sh 4.20% $100 par	5,000	$101.818	4.12%
SCHEDULE FOR JANUARY			
BONDS			BID DATE
Pennsylvania Electric—1st mtg due 1986	$21,000(a)	.....	Jan. 17
PREFERRED STOCK			
New Orleans Public Service—60,000 sh $100 par	$6,000	.....	Jan. 11
Pennsylvania Electric	8,000	.....	Jan. 17
COMMON STOCK			
Texas Utilities	$15,000(a)	.....	Jan. 31

Note—(a) Estimated.

Busway with Alcoa Aluminum Bus Bar

COSTS LESS,

SIMPLIFIES DESIGNS,

PACKS MORE POWER!

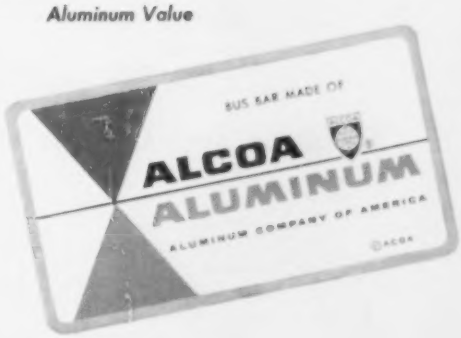
Westinghouse
Bus Duct being fabricated
at its Beaver, Pennsylvania, plant.

This new aluminum busway with Alcoa® *Aluminum* Bus Bar is one-third lighter than copper busway of equal conductivity. It has greater current-carrying capacity, pound for pound, than cable in conduit. It is prefabricated in standard sections . . . installs easily and quickly in any layout.

Alcoa's new No. 2 EC aluminum bus bar was developed to meet the demands of distribution bus for superior properties. It provides the most favorable combination of strength, conductivity, low creep and light weight at a significant saving in cost.

Wherever your production requirements demand an efficient, flexible electrical distribution system, specify busway with Alcoa Aluminum Bus Bar. Aluminum Company of America, 2313-M Alcoa Bldg., Pittsburgh 19, Pennsylvania.

Your Guide to Aluminum Value



ALWAYS USE ALCOA® ALUMINUM ACCESSORIES WITH ALUMINUM CONDUCTORS

STATISTICS

Generation in First 9 Months Tops '54 Period by 15.2%; Sales Up 16.4%

(In Millions of Kwhr)

In nine months ended Sept 30, 1955 utilities . . .		Of the total, utilities sold . . .	
Generated	400,571 (15.2% over '54 period)		89,284 to residential customers (11.2% more)
	(315,131 by fuel (up 18.7%)		8,328 to rural customers (5.1% more)
	/ 85,440 by hydro (up 4.1%)		60,049 to commercial customers (10.0% more)
			180,884 to industrial customers (23.3% more)
Imported	2,471		3,103 to street & highway lighting customers (8.1% more)
			7,531 to other public authorities (7.8 more)
Less	9,364 used by producer		1,884 to street and interurban railways (4.9% less)
	1,150 in company use		1,499 to electrified railroads (1.7% less)
	39,520 lost and unaccounted for		446 for interdepartmental users (3.9% more)
Leaving	353,008 in sales to ultimate consumers (16.4% higher)		

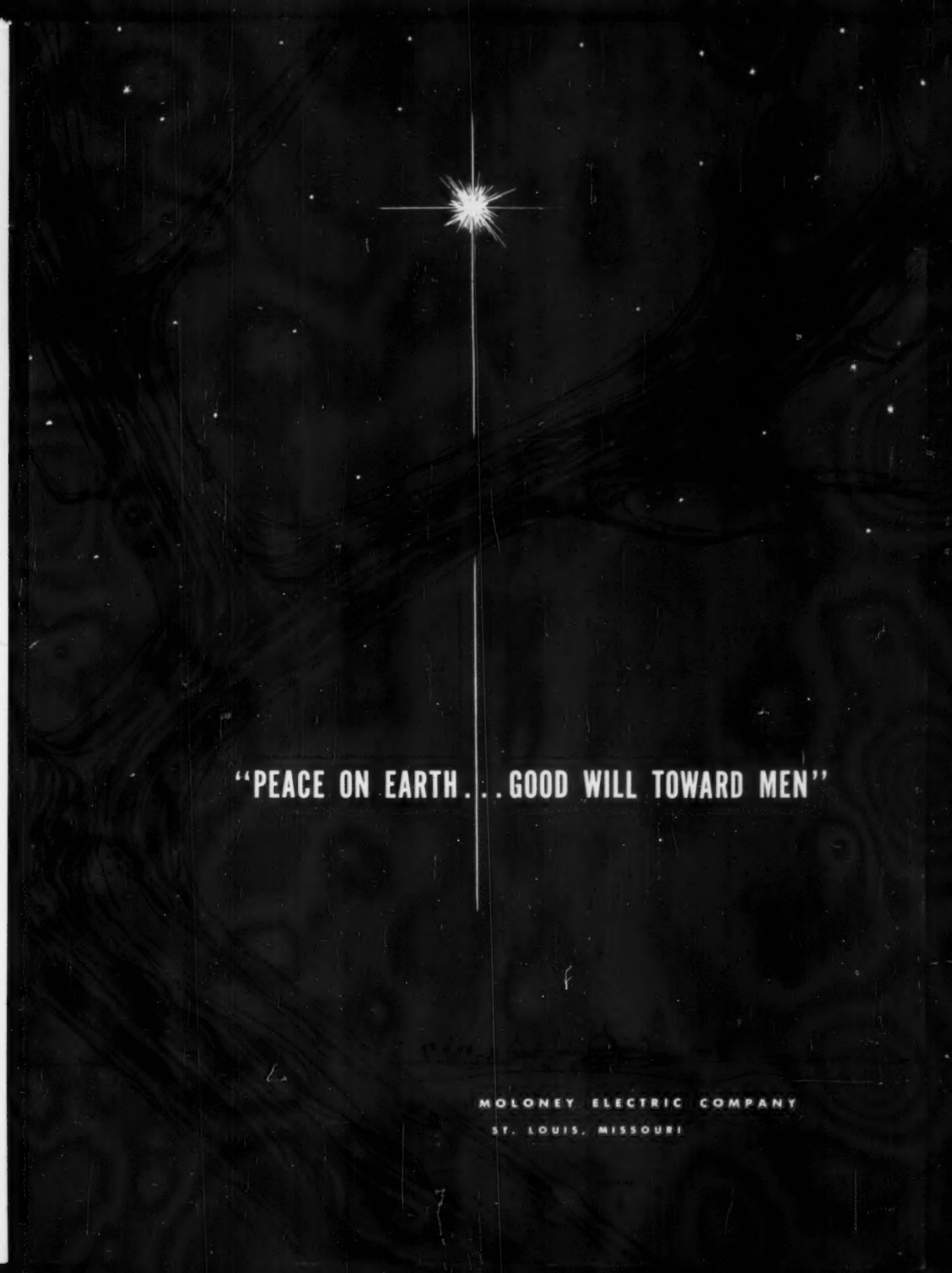
Source: Edison Electric Institute

Power Statistics . . .

		Latest Month	Preceding Month	Year Ago	Annual Change %
Capacity	Sept.	110.91	110.03	99.16	11.8
Peak—Class I Systems — million kw	Aug.	91.6	89.3	79.7	14.9
Estimated Dec. '55 Peak	Sept.	96.82	96.54	96.21	0.6
Production—billion kwhr	Sept.	46.34	49.35	39.55	17.2
Hydro		8.17	9.53	7.80	4.7
Fuel		38.18	39.82	31.74	20.3
Sales—billion kwhr	Aug.	43.44	40.89	36.28	19.7
Residential		10.46	9.89	9.30	12.5
Commercial		7.39	6.92	6.56	12.7
Industrial		22.84	21.50	17.80	28.3
Other		2.74	2.59	2.62	4.6
Fuel Consumption	Sept.				
Coal—million tons		12.07	12.59	9.72	24.2
Oil—million barrels		5.18	5.37	4.90	5.7
Gas—billion cu ft		120.17	132.55	118.62	1.3
Net Income Class A & B Co's—$ million	Sept.	100.23	93.95	92.26	8.6
Residential Customers—millions	12 mos.	44.10	43.96	42.82	3.0
Revenue per kwhr	ended	2.66¢	2.66¢	2.70¢	−1.5
Avg kwhr per customer	Sept. 30	2,698	2,682	2,497	8.0
Avg. annual bill		$71.77	$71.34	$67.42	6.5

Business Statistics . . .

Indexes: 1947–49 = 100					
FRB Industrial Production	Oct.	146	142	130	12.3
ENR Construction Cost	Oct.	141.2	141.0	134.6	4.9
BLS Cost-of-living	Oct.	114.9	114.9	114.5	0.3
NEMA Sales	Sept.				
Insulation materials		156	147	123	26.8
Electric appliances		131	111	115	13.9
Household refrigerators		85	86	73	16.4
Wholesale prices	Oct.				
Motors and generators		125.3	125.1	121.8	2.9
Transformers and regulators		129.2	129.2	128.1	0.9
Switchgear and fuses		146.3	146.1	135.1	8.3
GNP—annual rate—$ billion	3rd Qtr.	392.0	384.8	358.8	9.3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"KILOWATT INSURANCE"

Allis-Chalmers New 20-Minute Color Sound Slidefilm Tells Story of Distribution Transformer Protection

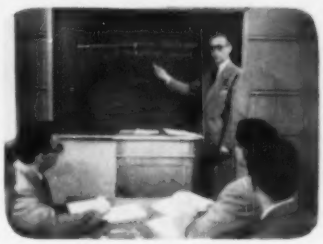
Prepared for Utility training groups and engineering students, Allis-Chalmers new color slidefilm "Kilowatt Insurance" provides a convenient, graphic explanation of the use of protective devices on distribution transformers.

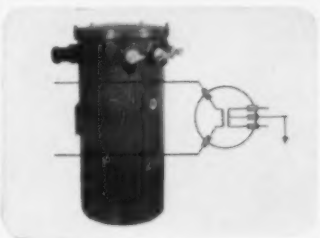
YOU SEE an explanation of the basic theory of transformer operating conditions — what problems are caused by lightning, overload and short circuits.

YOU SEE diagrams and pictures that explain transformer design characteristics which meet these various operating conditions.

YOU SEE solutions to these problems in the protective devices used on utility systems. In addition to diagrammatic and pictorial explanation, actual installation photos relate theory to daily practice.

Story is told in booklet form too — copies are available at all showings.





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of this new film. Call your nearby Allis-Chalmers office for information or write Allis-Chalmers, Power Equipment Division, Milwaukee 1, Wis.

A-4837

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